

American Aviation

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THE AIR
INDUSTRY'S
PIONEER
INDEPENDENT
MAGAZINE

Mystery Flight

A FEW MONTHS ago Capital Airlines conducted a "mystery flight" and captured some valuable publicity in *Life* magazine and did itself a lot of promotional good in the Philadelphia area where the flight originated. Now it has announced a similar flight out of Washington.

by
W. W. P.

The idea is sound. A lot of people still have a spirit of adventure in their souls. The idea of buying a ticket for a week-end flight without knowing in advance where you're going is intriguing. Capital's first flight was to the Bahamas—a

short but invigorating sunny week-end away from cold and dreary Philadelphia. We don't know where Capital is taking its next plane-load of guests except that it involves swimming and fishing, but we'll bet the patrons have a good time.

The flexibility and speed of the airplane is fascinating to a lot of the lay public but the average person rarely has a chance to deviate from the routine of scheduled trips. Owning a personal airplane is still costly and involves more work than the average person wants to put into it. He wants to have himself transported to far-away places at minimum cost and minimum trouble. He likes the scenery from the air, the mountains and the coastlines and all the other interesting terrain features, but he doesn't get much chance to explore.

Airlines are a business. Ideas have to pay or they aren't worth trying. Airlines have a daily routine job to do of providing reliable, scheduled air transportation. They can't afford to haul a lot of people around just for the fun of doing it. They have consistently improved their routine assignment, however, and are providing transportation at an increasingly lower fare.

Yet the airlines can do much to provide some of the flexibility and benefits of the airplane if they bring some of the same flair of imagination into their sales approach that the public often expects of them.

Mystery flights is one idea that can pay off. It is one means of utilizing equipment and personnel on dull week-ends. It has promotional value over and above the payload factor. Flights in the east to the Evangeline country of Nova Scotia, or to the Azalea Gardens of Charleston, S. C., or to the Blue Ridge mountains, or to numerous other points, could well

(Turn to page 8)



Pan Am Veteran Promoted

John C. Leslie, a veteran of 21 years with Pan American World Airways and a vice president since 1945, on June 1 becomes v.p.-administration. He succeeds the late Howard B. Dean. Leslie has served in executive positions in engineering, operations, and administration, and is credited with developing the engineering technique for long-range flight in 1935 which made possible the first commercial air service across the Pacific.

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BACKGROUND & TRENDS

Cautious on Lower Fares

Ralph Damon, TWA president, cautions against an overall reduction in airline fares. Action of the domestic airlines in lowering fares to 4.63c per mile after the war produced a condition leading to a \$20 million operating deficit in 1947, he warns. Fares below cost don't really give the public greater value for its money, he adds, citing the case of the railroads, who asked for and received freight rate increases to make up passenger losses. "Everybody who eats is paying for a piece of someone else's railroad passenger ticket," Damon says. He also has doubts on domestic skycoach services: "I am not at all certain that we can make them pay at load factors satisfactory for a continuing service attainable in a competitive market."

Record Year for Europe

Economic Cooperation Administration says more American tourists will travel to Europe this year than in the record year of 1930, when 359,000 made the trip. Reasons: Holy-Year, increased Atlantic passenger service since war's end, promotional campaigns by Western European countries to encourage year-round travel, and reconstructed and modernized hotel facilities. In 1949, 269,650 persons from the U. S. went to Europe. Great Britain was the greatest attraction, followed by France, Germany and Italy.

Less Red Tape

There's much less government red tape now on many of the world's air routes, although some trouble spots still exist, according to International Air Transport Association. Improvement is due to use of simplified and standardized documents and procedures put forward in Annex 9 to the ICAO Convention, which became effective May 1. Routes "substantially free" from red tape tie-ups include internal European lines; North Atlantic via Western Europe to South Africa; North Atlantic via Western Europe to Australia; Middle Atlantic routes to Europe, and long-line routes via North Atlantic to London, Rome, Western Europe, and Middle East, India and Pakistan, to Singapore and Bangkok. Trouble still exists between Europe and South America, and between U. S. and South America, Australia and Japan and the Philippines. There are also difficulties on inbound flights to U. S. and Canada. U. S. will need changes in legislation before it can conform entirely to the standards.

CAA Hits the Non-Skeds

CAA's 6th Region has started precedent-setting cases against two non-scheduled airlines that may set a pattern for action against others—and mean an early end for many non-skeds. CAA filed complaints with CAB for suspension or revocation of certificates of two large irregulars on the grounds that they operated in excess of frequency limitations defined in CAB's economic regulations. Heretofore, unlawful frequency proceedings have always been started by CAB, not CAA, and they've been aimed at revocation of the non-skeds' economic licenses—their letters of registration. CAB has had to prove that violations were "wilful and knowing." CAA, however, is aiming at the operating certificates. If a non-sked operates regularly, it is outside its irregular operating certificate, CAA says. And, most importantly, CAA doesn't have to prove a violation was "wilful and knowing," but only that it occurred. Extensive enforcement of CAA's new policy could produce a much quicker

end to non-sked violators than CAB's lengthy enforcement cases.

Big Non-Sked Increase

Despite increased competition from scheduled airlines' coach service and attrition in their own ranks, non-scheduled and contract air carriers showed large traffic increases in 1950's first quarter in the New York metropolitan area. At La Guardia, traffic shot up almost 250%, from 10,772 passengers enplaned and deplaned in the first three months of 1949 to 25,531 this year. Domestic airlines at LaGuardia went from 805,415 to 814,900 during the same periods. At Newark, the non-skeds increased from 29,313 to 40,501, although their incoming and departing flights were down from 2,568 in 1949's first quarter to 1,546 this year. Scheduled domestics increased passengers from 212,258 to 270,855 but their schedules also increased, from 15,292 to 19,564.

Prototype Chances

With support coming from both manufacturers and airlines, there's a chance that prototype aircraft legislation may pass this session of Congress. The only bill believed to have a chance is S. 3504, providing \$12.5 million of government aid over five years for testing (not constructing) prototypes. The so-called Merchant Marine of the Air bill, S. 3507, establishing a \$100 million corporation to build, sell or lease prototype aircraft, hasn't been favored by most witnesses at Senate hearings. Although industry officials support S. 3504, they express the opinion that it's only a partial solution. What's needed to meet the British challenge, they say, is a "comprehensive prototype procurement program."

Bombers and Fighters Needed

In a third world war, Russia would have initial air superiority, and the Red's productive capacity to support her air power is known to be both substantial and rapidly increasing, says Gen. Hoyt S. Vandenberg, Air Force Chief of Staff. The U. S. Air Force is inadequate, he states. It needs more of "the best bombers, all-weather fighters and escort fighters our industry is capable of producing."

Airlines Want Taft-Hartley

The airlines have gone on record as favoring removal of their labor problems from application of the Railway Labor Act and placing them under the Taft-Hartley Act. Robert Ramspeck, executive vice president of the Air Transport Association, told a Senate committee that the Railway Labor Act was tailored to meet problems of the railroads and their unions, and doesn't fit the airline industry. In addition, it doesn't draw lines of demarcation between employees who are entitled to all the benefits of the Act and supervisory personnel who are a part of management. He added, pointedly, that under the RLA the employee is given no opportunity to vote against unionization; the administrative agency (National Mediation Board) "regards itself bound to foster unionization, rather than freedom of choice by the employee"; and elections are conducted "in such confusion that the real desires of the employee group may not be revealed." There have been four airline strikes since the war, despite the Act's procedure for negotiation, mediation and cooling-off periods, he said, charging that the unions struck in violation of the statute whereas the airlines had been required to maintain the status quo because of the "one-sided operation of the . . . Act."



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News in Brief

Now Frontier Airlines: The three-way merger of Challenger Airlines, Monarch Air Lines and Arizona Airways has been completed with CAB's final approval and reissuance of the three feeder certificates in the name of Frontier Airlines, Inc., new corporate name of the merged companies. Monarch's certificate has been redesignated as Frontier's No. 73, Challenger's as Frontier's No. 74, and Arizona's as No. 93. Effective date of the new certificates is June 1.

Cargo Profit & Loss: Two of the four cargo carriers certificated by CAB showed 1949 profits while two showed losses, the net result being an overall loss of \$399,277 for the four. The Flying Tiger Line reported net profit of \$275,323 and Airnews, Inc., profit of \$36,417. In the red were U. S. Airlines with \$367,665 deficit and Slick Airways with \$343,352. The figures include both non-certificated and certificated operations, mostly the former.

Pioneer Completes Move: Pioneer Air Lines has completed its move of general offices and maintenance facilities from Houston Municipal Airport to Love Field, Dallas, without interruption of service in any way. Most of the 240 employees were ferried to Dallas by Pioneer planes.

Dividend by American? American Airlines' profit after taxes in April was \$930,000, and C. R. Smith, president, told stockholders that "the company is in good financial condition and could pay a dividend (this year) if earned." April operating profit before taxes was \$1,450,000.

Business Flying Boom: Business flying may soon surpass private flying in volume, Donald W. Nyrop, CAA deputy administrator, told the Third Annual Forum of the Corporation Aircraft Owners Association in Washington last week. He said that in 1940 pleasure flying accounted for three times as many hours of aircraft use as business, while in 1948 business flying nearly matched pleasure flying and may surpass the latter when 1949 figures are available.

Small Profit Margin: Major aircraft companies had a 1949 profit margin well below that of corporations in other U. S. industries, according to a report by Industry Planning Service of Aircraft Industries Association. The report lists the profit of 12 major airframe manufacturers for 1949 as \$36,100,000, or 3.2% of total sales. This compares with profit margin of 6.8% reported by the National City Bank for 1,710 manufacturing corporations.

Sikorsky Get Navy Order: Sikorsky Aircraft Division of United Aircraft Corp. has received a Navy order for ten H04S helicopters. This is a Navy version of the H-19 Air Force 10-passenger helicopter and will be used for anti-submarine work. The new order gives Sikorsky a production backlog of 16 units for the big helicopter and strengthens the company's position in the future commercial field.

C-W-Doman Agreement: Curtiss-Wright Corp. has concluded an agreement with Doman Helicopters, Inc., which will give C-W license to build and sell helicopters using the Doman rotor system. The license is for five years and is limited to helicopters of more than 250 horsepower.

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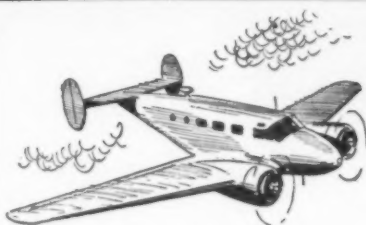
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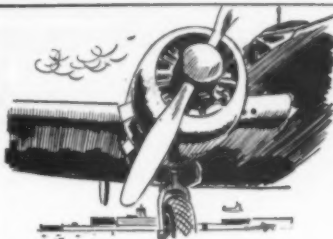
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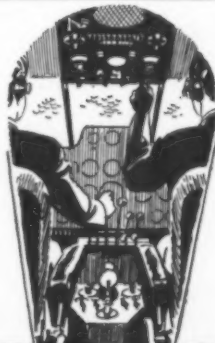
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EDITORIAL

(CONTINUED FROM PAGE 1)

pay off if handled in the right way—and priced right. The five-day week has provided folk with a great deal more leisure time—and longer week-ends. Flying provides a relief from crowded highways.

Another idea that is bound to come is the week-end excursion. This has long been a railroad practice and it can pay off in the air provided that airplane utilization can be accomplished. Take New Orleans as an example. A lot of people in the north would like to spend a day and a night there. Or excursions between two major cities with the same airplane taking people in both directions with departure hours arranged accordingly to provide the most efficient utilization.

In the west there are all sorts of opportunities for aerial flights to the big national parks and scenic areas.

Mystery flights and week-end excursions are not destined to be the back-bone of a scheduled air transportation system but they have a great deal of promotional value and they can be operated on a profitable basis. The airplane has stirred the imaginations of people ever since it was invented. In the routine daily transportation job we are all apt to forget this. The airplane is a very flexible vehicle—why not use it to the best advantage and let the people see and enjoy more of this great country of ours? Airport-to-airport service is *transportation* but off-line flying can be an adventure welcomed by a sizeable segment of the public.

Stamp for Pilots

THE POST OFFICE has put on sale a 3-cent commemorative postage stamp honoring American railroad engineers. An initial printing of 115 million copies of this stamp has been authorized.

Ed Slattery, Jr., chief of public information for the CAB, has launched a movement to persuade the Postmaster General to issue an air mail stamp commemorating all airline pilots. This is a fine idea and should take hold. The railroad engineer stamp is well justified but the airline pilot has likewise made an important contribution to carrying the U. S. mail. Many pilots have lost their lives in so doing. Let's hope Slattery's unofficial crusade gets the support it merits.

Aircraft Overhaul

WE WERE GLAD to see Representative Carl Hinshaw, civil aviation's outstanding champion in Congress, protest recently the practice of the Air Force in retaining a large volume of its aircraft overhaul work in its own shops. Mr. Hinshaw pointed out in a floor speech that both the Congressional and the President's aviation commissions had recommended strongly that more of this work be done under private contract as a means of maintaining private establishments in readiness for time of war and at the same time contributing to the maintenance of the skills in reserve components of the Air Force.

Now the Air Force proposes to overhaul 2,342 aircraft in its own bases and only 293 by private contractors. The proportions should be in reverse.

Good Promotion

CLEVER BOOKLETS and high-density-seating airplanes are not new in the air transport business, but Delta Air Lines has made up a little questionnaire-booklet about its new 28-passenger DC-3, that ought to take some sort of a prize. The booklet does a two-way job of describing and explaining the modified DC-3 to the customers and asks them how they like the various new features. Currently the DC-3 is on a tour of the system. No multi-colored deluxe job, the booklet is a simple off-set production. But it tells the story amusingly and well.

Not So Bad

AFTER SLIDING sharply down the chart from an all-time high in 1946, personal airplane production seems to have hit the low point. The most encouraging outlook is that despite the sharp drop from 1946, personal airplane production is definitely ahead of prewar years.

Back in 1935 everybody was quite happy when production hit 917 for the year and the highest prewar year was 1937 with a production of 2,065. Production this year is expected to be over 3,000 and the purchasers are much more likely to keep flying than were the plane buyers of prewar days. More business people and more flying farmers are buying airplanes and the trend towards the four-place job has become more pronounced as times goes on.

And now comes the Heliplane about which so much has been said and written. Whether it will be the answer to the prayer remains to be seen, but it is certainly one of the most hopeful signs on the horizon. Beech Aircraft Corp. reports a backlog of orders for the Bananza and its current optimism has solid support in its sales figures for the year to date. The personal airplane picture is far from being as gloomy as some of the skeptics would have us believe.

Air Replaces the Rails

OUT IN TEXAS the Santa Fe Railroad has been losing money on its passenger trains between San Angelo and Fort Stockton. The Texas Railroad Commission granted permission to the railroad to discontinue the service on April 21. On the same day that the McCamey, Texas, *News* reported this action, it was announcing the inauguration of daily scheduled air service by Trans-Texas Airways. The air took over from the rails for local service to a number of west Texas communities. Here is something for the CAB and Congress and the Post Office Department to ponder when it studies the cost of air service. Local airlines can often take over local transportation and do a better job, at less cost, than the rails.

WAYNE W. PARRISH

AMERICAN AVIATION



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This picture shows what American Overseas Airlines is doing about it. The walls, well lining, rail covering, arm rests, and many other places in their Boeing Stratocruisers are trimmed with Avtrim. This new B. F. Goodrich flexible

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The list of places where airlines are cutting costs with Avtrim flexible material is a long one. It includes baggage racks, walls, floor coverings, bulkheads, and many other applications. For help on decorating with Avtrim, write to *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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DETACHABLE FUSELAGE COULD CUT IN-TRANSIT SUPPLY TIME FROM MONTHS TO HOURS

By JAMES J. HAGGERTY, JR.

SOME TIME within the next 60 days a radical, new type of aircraft will be flight tested for the first time, and with it, a number of Air Force and Army Field Forces officers hope, will start an entirely new air logistics concept.

The plane is the Fairchild XC-120; it is novel because the entire fuse-

In Swarmer the potential usefulness of detachable-fuselage aircraft was apparent in two major cases: the provision of support services and the actual loading and unloading of airline-type aircraft. In the former case the need was most noticeable. Establishing an airhead, obviously, requires more than merely landing troops.

Weatherproof Assault

You need GCA by which to land the airplanes, if the operation is to be sustained; you can't afford to let weather interfere once the assault has started. You need a communications set-up. You need machine shops, instrument repair shops, engine overhaul shops, a mess kitchen and countless other support services. All of these services have to be available at the start of the operation, not days later.

How, then, do you get them? In Swarmer they had no answer. They took the easy way out by "simulating" the flying-in of these services. In the case of GCA, for instance, they trucked it in days before the airhead assault started, in order that it might be ready for the first plane to land.

That's where the pod comes in. At a rear base, all of these support services could be set up and ready in pods. When the time is ripe, they could be carried in to the airhead in the first wave, detached from the airplane and in a matter of minutes you have a complete base services organization ready for business.

The value of pods in unloading at the airhead is obvious. No matter how efficient your unloading crews, no matter what type of conveyor systems you employ, there is still the physical problem, in conventional type aircraft, of moving your cargo off the airplane piece by piece.

Quick Turn-around

In Swarmer, unloading times ranged from 45 minutes for the Doug-

las C-74 to about 15 minutes for the Fairchild C-82 and C-119 Packets. With a detachable fuselage aircraft, the pilot simply pulls a lever and the pod detaches itself from the airplane and is towed off to a supply depot by a tractor, leaving the plane free to make another mission.

With the Air Force's new emphasis on troop support operations, it is entirely probable that some type of detachable fuselage aircraft will go into production next year, and the Air Force has received a number of proposals, either, for new aircraft or for pod modifications of existing aircraft. Fairchild Aircraft Division, whose Packets have established for the company a reputation as the leading ground support airplane manufacturer, is, of course, very much in the picture. Besides the XC-120, Fairchild has two other pod proposals—the M-142 and M-144, detachable fuselage versions of the C-119 Packet.

Fairchild's XC-120, in its current configuration, may not be the answer to the detachable fuselage requirement for one major reason, a quadricycle type landing gear which has caused plenty of trouble and has delayed first flight of the airplane.

One reason for the novel gear was the fact that Army officials felt that the pod should be towed off forwards; thus the standard nose wheel had to be eliminated and two out-



THIS DRAWING of Fairchild's XC-120 Pack Plane, which will fly this summer, illustrates the principle of detachable fuselage aircraft. The fuselage, or "pod," is separated from the tractor portion of the plane and towed to a supply depot, leaving the airplane free to pick up a return pod or fly podless back to a rear base for another load.

lage may be detached from the airplane, either on the ground, in much the same manner as a transport truck detaches its trailer, or in the air, in which case the fuselage, or "pod," would be floated to earth by giant, specially-designed parachutes.

Any observer at the recent Exercise Swarmer is aware of the potentialities of this type aircraft. Swarmer, you recall, was a joint Army-Air Force maneuver in which the problem was to seize an "airhead" in enemy-held territory and expand it by pouring troops and supplies through it entirely by air. There are certain basic problems connected with this type of operation which point up the desirability of pod-type aircraft.

POD CHAMPIONS visualize something like this as the answer to the overseas logistics problem in the next war. Long-range detachable fuselage aircraft, such as the XC-120 in the foreground (1), fly the pod from a domestic embarkation center to a central overseas base, where it is detached and picked up by a short-range pod-carrying helicopter like the Piasecki XH-16 shown (2), which flies it directly to the unit for which the supplies are intended.



rigger wheels under the engines substituted. The new M-142 and M-144 configurations will use the standard Packet tricycle gear; the fuselage will be cut away and a pod substituted.

Packet Modification

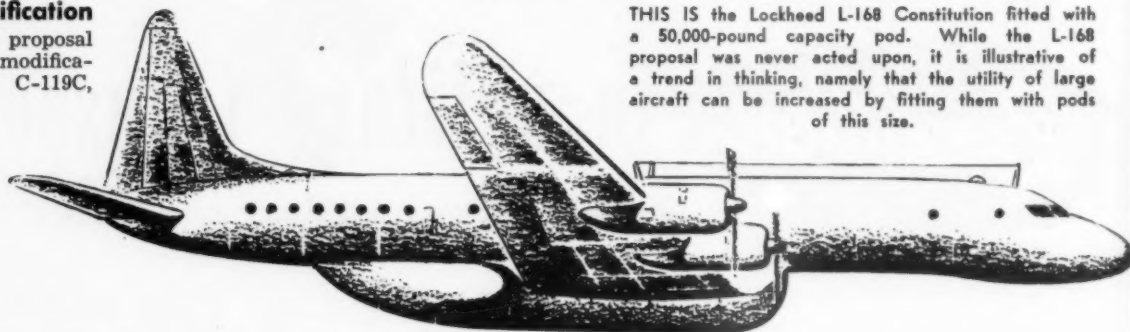
The M-142 proposal is simply a modification of the C-119C,

ter, a weather station, a power supply unit, a marker station, a first aid station or a field headquarters.

In another proposal, Lockheed demonstrates how the pod principle

greater utility for the pod. Given enough pod aircraft, they point out, the entire military war-time logistics system could be modernized.

They trace the pattern of a given



THIS IS the Lockheed L-168 Constitution fitted with a 50,000-pound capacity pod. While the L-168 proposal was never acted upon, it is illustrative of a trend in thinking, namely that the utility of large aircraft can be increased by fitting them with pods of this size.

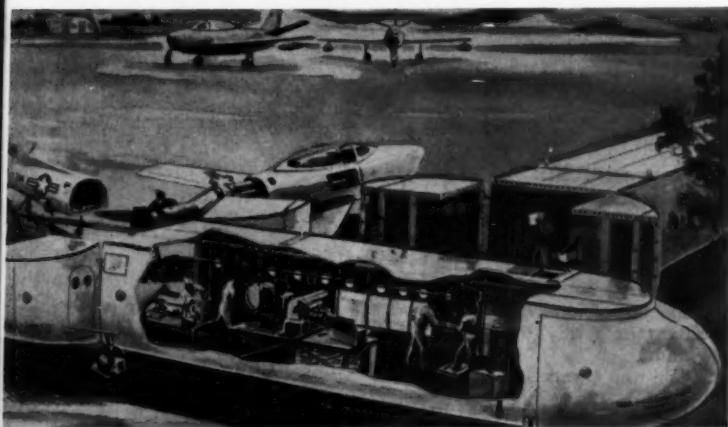
with a truncated fuselage to provide for the pod. Power plants would be the Pratt & Whitney Wasp Majors now in use. The M-144 would have the same cutaway fuselage, but would be powered by two Allison T-40-A-6 turbo-prop engines turning dual-rotating propellers. The additional power would permit an increase in maximum gross weight to 77,000 pounds and provide the additional speed so important in a turn-around operation such as airhead resupply.

could be applied to existing aircraft. Lockheed offers a modification of the Navy's R6O Constitution, known as the L-168 Constitution, in which a large pod, capable of holding 50,000 pounds of cargo is slung underneath the fuselage.

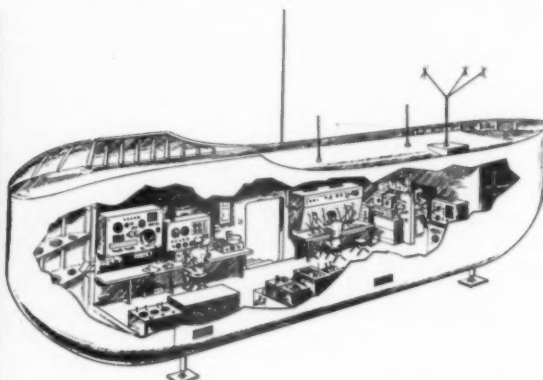
Ammo, Fuel & Food

The company points out that six pod-equipped L-168's could provision an entire infantry division with 53 tons of food, 104 tons of fuel

piece of equipment destined for an overseas unit: it moves from the manufacturer's plant to a military depot, then to a point of embarkation, after which it takes a long boat trip (and may never reach its destination if the enemy has an effective submarine fleet) to a receiving depot in the overseas theatre, then by surface transportation to a sub-depot, then to a division warehouse and finally to the supply tent of the unit for which it was intended. The whole



PODS CAN be used as compact operational units. Here a machine shop layout is installed in the pod of a Fairchild XC-120.



THE POD of a Lockheed L-168 Constitution provides a roomy, complete communications center.

In both proposals, the pod would be towed away from the airplane from the rear, permitting the use of normal tricycle landing gear.

Lockheed Aircraft Corp. also has some pod proposals. One involves the "Speedpak," a pod already in use as a cargo carrier on some commercial airlines. Lockheed has redesigned its Speedpak and enlarged it; the newly engineered pod is 33 feet 4 inches long, 7 feet 4 inches wide and 6 feet 3 inches high. With these new dimensions Lockheed believes that the Speedpak could be put to use as an operating unit.

In a brochure for the military, Lockheed shows how the pod could be set up as a compact GCA unit, a control tower, a communications cen-

and 110 tons of ammunition daily. The proposal also points out that the big L-168 pod could double as a heavy equipment carrier, carrying, in one pod, such loads as 18 jeeps, two 2½-ton trucks or one heavy wrecker.

Since there are only two Constitutions and no further production is contemplated at the moment, the L-168 proposal will probably never become a reality. It is cited here only to point up a trend in thinking, i.e., that large pods could be fitted to existing large aircraft and perform the same function as that of the detachable fuselage.

While the advantages of pod-type aircraft in airhead or ground support operations are apparent, some pod champions visualize an even

process takes not days or weeks, but months, and there is always the possibility that it may never reach its destination.

The pod champions envision an aerial merchant marine consisting of large numbers of detachable-fuselage long-range aircraft and short-range pod carrying helicopters like the Piasecki XH-16 now in development.

The long-range planes ferry the supplies across the ocean to a central receiving point, drop their fuselages and return; the helicopter picks up the pod and flies it directly to the unit for which it is intended. Result: the elimination of the numerous in-between depots, an in-transit time measured in hours instead of months, and freedom from submarines.

Helicopter Airline

... World's First
With Passengers

The world's first scheduled passenger service by helicopter was to be inaugurated this week between Liverpool, England, and Cardiff, Wales, a distance of 130 miles.

The service will be performed by a fleet of four-place Sikorsky S-51's operated by British European Airways' Helicopter Unit, which since last fall has been operating a scheduled helicopter night mail service between Norwich and Peterborough.

The new passenger service will make two roundtrip flights daily, one of which will be a nonstop between Liverpool and Cardiff. The other will stop at Wrexham on demand. The Liverpool-Cardiff fare is \$9.80 one way and \$15.40 roundtrip.

Scheduling has been arranged so as to provide connections with BEA's Dakota services between Liverpool, Belfast and the Isle of Man, and with Aer Lingus flights linking Liverpool and Dublin.

Flies Between Airports

Peter Masefield, chief executive of BEA, has emphasized that the new service must be regarded only as another step, although a significant one, toward full commercial exploitation of helicopters by an airline.

The Liverpool-Cardiff service is from airport to airport, but it is anticipated that, when twin-engined rotary aircraft carrying upward of ten passengers may become available within the next three or four years, BEA will operate scheduled services from center of city to center of city.

One craft to which BEA is looking is the Bristol 173, a 10-passenger twin-rotor helicopter, the prototype of which will undergo flight tests in the near future. Still further into the future, toward the late 1950's, BEA's management foresees the possibility of operating helicopters carrying up to 30 passengers on short-haul inter-city routes.

The BEA Helicopter Unit, formed in 1946, acquired some Sikorsky S-



BEA Mail 'Copter—Sikorsky S-51 helicopters such as the one pictured here, which has been used by British European Airways' Helicopter Unit in scheduled mail service, will be used by BEA in its first scheduled helicopter passenger service starting June 1. This equipment will be replaced by helicopters with greater seating capacity as soon as they become available.

51's and Bell 47-B's and in early 1948 inaugurated a helicopter mail service in cooperation with the British General Post Office.

Night Mail Trials

This led to a dummy night mail trial service in the early spring of 1949, and the overall regularity of 73% achieved in this operation under exceptionally adverse meteorological conditions was considered satisfactory. More important, though, many lessons were learned from this experiment and the pilots acquired confidence in their ability to operate at night and under blind flying conditions.

Finally, British postal authorities and BEA's Helicopter Unit last October inaugurated a scheduled night mail service on a six-months experimental basis between Peterborough and Norwich. This necessitated that the unit's helicopters be certificated for blind flying, which they were.

The experimental period was not completed until the latter part of April and it is too early to assess the results, but BEA management feels that good punctuality and reasonable regularity were achieved.

On the operational side, BEA has no misgivings whatever in inaugurating the world's first scheduled helicopter passenger service. On the economic side, the picture is not so bright.

Present operating costs of the S-51's works out at slightly over \$2.00 per capacity-ton mile, and the ships will carry only three passengers. It is felt, however, that costs can be reduced to about 50c per capacity ton mile when larger machines with increased relative payload and increased cruising speed become available.

U. S. to Install ICAO Type Lights; Retain Slope Lines

Single row approach lighting systems conforming with the International Civil Aviation Organization's type "A" system will be installed by the Civil Aeronautics Administration at a number of U. S. airports before the end of the year.

The installations will consist of a single row of the linear bar lighting fixtures used in the slope line system, located on the left side of the approach lane and extending up to 3,000 feet out from the threshold of the runway.

Further installations of the U. S. standard slope line configuration, which has two rows of lights and appears funnel-shaped to an incoming pilot, will be made only at those locations where weather conditions and traffic density justify such an installation and limited availability of land and the nature of the terrain does not preclude it.

CAA's action was hailed by airlines of other countries, most of which have preferred the single row or type "A" system over the U. S.-adopted double row standard and accordingly have held up installations of approach lighting to see whether there would be any change in this country's thinking.

It was emphasized by CAA officials that the funnel-shaped configuration has not yet been abandoned and will continue to be used under conditions of very low visibility. The type "A" system, however, is considered adequate for approach lighting at airports where weather conditions are not so adverse.



2100 R.P.M.
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123,000 piston strokes

every second

24 hrs.
 $\frac{60}{1440}$ min
 $\frac{60}{86,400}$ sec. per day

lubricated by

49
 74
 13
 $\frac{3}{139}$ planes

3528 DC-6
 896 DC-4
 $\frac{2664}{7088}$ C.V. pistons

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COMPANY Aviation Sales, 630 Fifth Ave., New York City

IATA Looks at the Jet Transport

By WILLIAM D. PERREAULT

JET TRANSPORTS may or may not be economically feasible at this time but two things are certain: (1) the pace of developments and results of operating experience far exceeds earlier hopes, and (2) there are many popular misconceptions about turbine powered aircraft.

Late last month some 200 representatives of the world's international airlines, meeting for the fifth annual International Air Transport Association Technical Conference at Asbury Park, N. J., attempted to separate facts from fiction. In a two-day symposium on jet turbine transport operations, the group succeeded in unraveling many of the conflicting views.

Fuel Reserves

Many of the real problems are policy matters. Current CAR establishing fuel reserves are not realistic for turbine-powered aircraft. Until such time as realistic reserves are established an intelligent economic analysis is impossible. Fuel reserves and payload come out of the same package.

Using the same reserve criteria as now used for the Boeing Stratocruiser, a 150,000-pound Boeing-built jet would require 17,000 pounds of fuel instead of the 9,000 pounds used by the B-377. This is more than the total payload, a Boeing representative said.

Authorities have been reluctant to establish reserves until more is known about operating conditions of this transport. Earlier evidence indicated that the jet-powered airplane could not operate at low altitudes because of high fuel consumption. While this remains basically true, the advent of multi-engine jets minimizes the condition. By shutting down two of four engines the range is substantially the same at lower altitudes as when operating at higher altitudes on four engines.

Other factors controlling the fuel reserves include the accuracy of wind and temperature forecasts, traffic control procedures, navigation accuracy, and storms. It is universally agreed that navigation is simpler at high altitudes. Conventional navigation equipment will do the job. Boeing noted that in operating the B-47 they had never missed a range calculation by more than 2%.

Commercially this was verified by the operating experience of the de Havilland Comet and the Avro Jetliner. The Comet, in flights from England to Africa, had not missed an

Many important facts were uncovered during the IATA Technical Conference. In addition to the small cross-section of material discussed by the Jet Symposium which is presented on these pages, more details and pictures will be included in forthcoming issues of AMERICAN AVIATION.

estimated time of arrival by more than two minutes. In several circuits, including two into the U. S., the Avro C-102 has had substantially the same experience.

Operating between 30,000 and 40,000 feet, these airplanes were not running into the severe storms occurring at lower altitudes. Reserves provided to circumvent such storms, as provided for in current requirements, were not used and were consequently available for holding purposes at the destination. There is every reason to believe that pressure pattern flying will be usable at these high altitudes. The present accuracy of radio altimeters and related equipment used in this type navigation is suitable at 40,000 feet.

Gusts

Clear-air gusts, a point of considerable concern among the operators, are still receiving consideration but the operating record is encouraging.

In 250 hours of operation the Comet had encountered only one such gust and this was not in entirely clear air. There was ample warning to avoid it. Choosing to go through the gust, de Havilland recorded about a 2 G gust.

A British research group, searching for data on clear air gusts, has been unable to encounter more than .7 G during two years of flight research. When encountered at high speeds, gusts do not have the same effect as those encountered at lower speeds. Known as sharp edge gusts, the plane encountering these phenomena gives the passenger a shaking not unlike an automobile ride over a rough road.

Inspection Difficulties

While this experience will not apparently be dangerous or overly objectionable to the passenger, it will present inspection difficulties. Often the true seriousness of these apparently minor encounters can test the structural integrity of the airplane. For this reason the existing jet transports have been built for high gust factors, between 7 and 8. Use of VG recorders might be advisable. AOA, is presently using these recorders on their Boeing Stratocruisers.

The swept-wing design, similar to that of the Comet and Boeing B-47, has "excellent unloading characteristics" and will minimize the effects of gusts on the structure as well as on the passenger.

At present the USAF long-range



Warner Visits IATA—

Dr. Edward Warner, (center), president of ICAO, made a surprise visit to the IATA Technical Conference. He is shown here with other personalities who made extensive contributions to the conference's success. They are, (l. to r.): Stanislaus Krzychowski, secretary of the IATA technical committee; John C. Leslie, v. p.-administration, Pan American World Airways; Warner; Harold R. Harris, v. p. and general manager of American Overseas and conference chairman, and H. W. Ree, v. p.-engineering and maintenance for Norwegian Airlines and vice chairman of the conference.

forecasts of winds at altitudes can be considered accurate within plus or minus 20 knots. This is not considered satisfactory for commercial use. de Havilland stated that a 20-knot error in wind correction would mean a 4% difference in fuel consumption. On a 2,000 mile Comet flight this would reduce reserves by seven or eight minutes. Errors in anticipating correct temperatures are even more critical, particularly in the early stages of the flight.

It was concluded that wind forecasts within plus or minus 10 knots and temperature within plus or minus 5° C are required. Representatives of IATA's meteorology group stated that considerable meteorological data is available at high altitudes for the European, North American and North Atlantic areas but work is underway to insure more data on all areas and to improve the accuracy of current predictions.

Jet Streams

Still on the list of unknowns is the frequency and exact nature of jet streams. It is believed that these are thermal winds. It has been suggested that 100 mph be used as the line of demarcation between thermal winds and jet streams. Jet streams are high-velocity winds, often in the 150-200 mph range, which occur in tubular-like areas at altitudes above 15,000 feet. Jet streams are apt to be about 1,000 miles long and up to 200 miles in width. The velocity of the wind drops off rapidly near its edge.

Once contact is made and location of the jet stream established, it is considered that their progress can be tracked and they can be avoided. Little is known about the jet stream but it is not likely that on a given day not more than one stream would exist in an area such as represented by a trans-Atlantic crossing.

Takeoff Problems

Problems related to takeoff and landing remain prominent. It was agreed that assisted takeoff, using any of the current aids, is impractical for commercial use. JATO is too heavy and too expensive for everyday use. Afterburning or jet pipe reheat is noisy, expensive and too heavy a drain on limited fuel supplies. Designers are working toward use of a 6,000-foot runway. Temperature variations will make runway lengths critical but use of water-methanol injection to restore power on hot days will minimize the problem. Avro uses about 10 gallons of water methanol per minute and one minute is about the full time requirement.

The possibility of giving the airplane a rolling start off a taxi-way prior to starting the takeoff run has been studied and dismissed as impractical.

Retention of the propeller on turbo-

prop powered aircraft will minimize many operational problems of the turbo-jet, none more than the deceleration following landing. The manufacturers appear to have almost universally discarded the idea of reversing the jet engine thrust to aid in deceleration because of the mechanical complexity involved. Reverse JATO has also been ruled out by most manufacturers.

Boeing's experience using a 30-foot parachute for landing deceleration has been gratifying. Contrary to popular impression, the parachute gives a smooth, instantaneous deceleration. Full effect is obtained about three seconds after the control is operated. When the chute opens it will stabilize a weaving airplane. Little chute wear is experienced because, as long as the engines are operating, the chute never strikes the ground. No special repacking is required. Originally scheduled for emergency use only, Boeing now uses the parachute on all landings with the B-47 because it virtually eliminates brake maintenance.

Pressurization

Explosive decompression has been an active fear among airlines considering high-altitude flights. Pressurization is needed to provide breathing oxygen at the high cruising altitudes of turbine aircraft. At 40,000 feet it takes a differential pressure of over eight pounds to keep the Comet's cabin at a pressure level equivalent to 8,000 feet. The Avro C-102 requires 8.3 pounds psi differential to maintain the equivalent of 4,000 feet pressure altitude at 25,000 feet.

Both the Lockheed Constellation and Boeing Stratocruiser, operating at 4 and 6½ psi respectively, have had pressurization failures which had serious results. Introduction of even higher pressures indicated above is causing genuine concern. The British airplanes use inward opening doors which tend to seal under pressure. This minimizes trouble with the most critical opening but U. S. Civil Air Regulations do not permit inward opening doors. U. S. manufacturers and operators are promoting a change in this regulation.

Boeing indicated it intends to keep all openings at a minimum size to reduce the possibility of explosive decompression. Using a pressure differential of 9.5 psi Boeing feels that explosive decompression is unlikely. Unless "an eight-foot hole" were ripped in the fuselage, high pressurization capacity would make explosive decompression impossible.

Cabin windows appear to be the weakest link in the pressurization picture but de Havilland has been conducting successful window tests under 100 psi pressure daily for many months and feel that adequate strength can be supplied. Douglas

has developed a laminated plastic window which is not affected by common cleaning chemicals as most present day plastics have been.

Aviation Calendar

June 1-3—Aviation Writers Association convention, Mount Royal Hotel, Montreal.

June 2-11—7th annual Michigan Aviation Week (sponsored by Aero Club of Mich.).

June 3-4—Fifth annual Shawnee Air Fair & Industrial Exposition, Shawnee, Okla.

June 4-9—SAE summer meeting, French Lick Springs Hotel, French Lick, Indiana.

June 4-9—CAA Airport Advisory Committee meeting, Everglades Hotel, Miami, Fla.

June 10-13—National Aeronautic Association 28th annual convention, Hotel Statler, St. Louis, Missouri.

June 12-14—Aviation Distributors and Manufacturers Association mid-year meeting, La Salle Hotel, Chicago, Illinois.

June 17-18—All Woman Annual Air Show, International Airport, West Palm Beach, Fla.

June 21-25—Ninety-Nines convention, Ft. Clark Guest Ranch, Branchettsville, Tex.

June 26-30—American Society for Testing Materials annual meeting and exhibit of testing apparatus and equipment, Atlantic City, New Jersey.

June 29-July 1—The Institute of Navigation national meeting, El Cortez Hotel, San Diego, California.

July 12-14—Institute of the Aeronautical Sciences annual summer meeting, IAS Western Headquarters Bldg., Los Angeles, California.

July 14-16—National Pilots Air Meet and Races, Chattanooga Municipal Airport, Chattanooga, Tennessee.

July 17—Conference of National Aviation Organizations first meeting, Washington, D. C.

July 25-30—Academy of Model Aeronautics national model airplane championship contest, Naval Air Station, Dallas, Texas.

July 30-Aug. 13—National soaring contest, Grand Prairie, Texas.

Aug. 19-29—1st Annual California Air Freight Clinic, Oakland, Calif.

Sept. 2-4—National Air Races, Cleveland, Ohio.

Sept. 4-6—National Flying Farmers Association annual convention, Bemidji, Minn.

Sept. 28-30—Air Reserve Association annual convention, Hotel Texas, Ft. Worth, Texas.

Sept. 28-30—International Northwest Aviation Council 14th annual convention, Sun Valley, Idaho.

Oct. 2-4—National Association of State Aviation Officials annual convention, Minneapolis, Minnesota.

Oct. 26-27—Fifth Annual Aviation Conference, Tucson, Arizona.

International

Sept. 5-10—Society of British Aircraft Constructors annual flying display and exhibition, Farnborough, England.

Oct. 16-20—IATA Annual general meeting, Fairmont Hotel, San Francisco, California.

Oct. —ICAO Rules of the Air/Air Traffic Control Div. Meeting, Montreal, Quebec.

Nov. —ICAO Middle East regional meeting, tentative, location undecided.

Nov. —ICAO Airworthiness/Operations meeting, location undecided.



WORLD LEADER IN JETS....

F-33

F-80

F-94

F-90

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The largest producer of jet aircraft in the world is the Lockheed Aircraft Corporation.

More jet-propelled airplanes have come from the Lockheed plant than from any other factory. In fact, Lockheed has built jets at the rate of at least one a day—every day for more than five years.

Lockheed produced the first U. S. operational jet airplane—the famous F-80 *Shooting Star*, long the backbone of America's fighter defense.

Lockheed leads in the jet training program, too, producing the two-place T-33 and the TO-1 jet trainer for the Air Force and the Navy. These are the only jet trainer airplanes produced in America today.

And to win and maintain air superiority behind enemy lines, Lockheed has built the long-range, twin-jet F-90 Jet Penetration Fighter.

Now, for high-altitude interception, Lockheed is building the new F-94 All-Weather Interceptors, capable of around-the-clock, around-the-calendar defense.

These dependable Lockheed Jets have many mutual advantages—speed, strength and producibility. And the experience obtained in the design, development and manufacture of these practical jet airplanes is invaluable in the Lockheed laboratories where the planes of the future are taking shape today.

LOCKHEED

Aircraft Corporation, Burbank, California

Look to Lockheed for Leadership

AMERICAN AVIATION in Lightplane Race



Only national aviation trade publication with an entry in the 4th Annual Ninety-Nines All-Women Transcontinental Air Race from San Diego, Calif., to Greenville, S. C., June 11-15, is **AMERICAN AVIATION'S** local operations editor, Barbara Ward, shown above in the red and silver Ercoupe provided by Sanders Aviation Inc., Riverdale, Md. Miss Ward, a wartime ferry pilot with the WASP and former accident analyst for the Air Transport Command, has logged

600 flying hours, including instrument rating.

The race will be an efficiency competition, with each participant handicapped on the basis of advertised cruising speed of the lightplane being flown.

AMERICAN AVIATION'S entry headed westward last week on a route running from Washington-Richmond-Charleston-Meridian-Dallas-El Paso-Tucson-Long Beach-San Diego, with Miss Ward checking the business health of fixed-base and airport operators en route.

People in the News

A. C. Hahn will be acting Assistant Postmaster General until appointment of a successor to **Paul Aiken**, who resigned the post to seek the Democratic senatorial nomination in Kansas. Hahn has been Aiken's assistant.

Lt. Gen. Lauris Norstad, former Deputy Chief of Staff, Operations USAF, has been appointed as Acting Vice Chief of Staff, pending appointment of a permanent assignee to the post vacated by the death of Gen. Muir S. Fairchild in March.

Charles J. Roggi, a member of the research staff of the Air Transport Association, has been named assistant to Robert Ramspeck, executive vice president of ATA, on a temporary basis pending possible reorganization of the Office of Public Affairs.

Herbert Richard Grumann, formerly with Curtiss-Wright Corp. and McDonnell Aircraft, has been named associate professor of aeronautical engineering at Parks College of Aeronautical Technology of St. Louis University.

Maj. Gen. James S. Stowell has been promoted from deputy commander to commander of Military Air Transport Service's Continental Division, replacing **Maj. Gen. Bob E. Nowland**, who retired after more than 31 years of service. Also retired is **Maj. Gen. Paul L. Williams**, after more than 30 years

service. His post as commanding general of the 10th Air Force has been taken over by his former deputy, **Brig. Gen. Harry A. H. Johnson**.

Airline Financial Reports

Domestic airline financial results in the historically unprofitable first quarter generally are showing improvement over last year, with only a few of the reporting carriers failing to register gains.

Here are how the 1949 and 1950 first quarter financial results of 12 of the domestic lines compare:

| Carrier | 1950 1st Quarter (Profit or loss) | 1949 1st Quarter (Profit or loss) |
|-----------|--|--|
| Capital | —151,902 | —499,120 |
| C&S | —72,715 | 36,021 |
| Delta | 272,644 | 238,479 |
| Eastern | 1,569,999 | 1,298,065 |
| MCA | 39,485 | 2,453 |
| National | 1,043,313 | 688,577 |
| Northeast | —271,132 | —195,588 |
| Northwest | —3,612,000 | —1,530,061 |
| Pioneer | 42,560 | 4,987 |
| TWA | —1,844,049 | —3,013,020 |
| United | —1,993,681 | —3,323,136 |
| Western | —37,707 | —128,529 |

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WASHINGTON, D. C.

Between the Lines:

F-80 Swan Song

By James J. Haggerty, Jr.



COME NEXT month we'll pass another aviation milestone when engineers of Lockheed Aircraft Corp. put the finishing touches to the last F-80 Shooting Star, the 1777th model of a very distinguished airplane. It's hard to believe that the plane which only a few years ago brought a new era of flight propulsion to the U. S. is now a "dead duck," joining the piston-engine fighters of World War II in the graveyard of obsolescence.

Not that it won't be flying for some time to come; it is still in use with Air Force units both as a fighter and a reconnaissance plane. But it just reached a stage of development where even souped-up engines and minor modifications could no longer keep it competing with the "hot" jobs now in production.

The "80" was a pretty fair airplane in its day. It was an "80" which brought the world's speed record back to the U. S. in June, 1947, after 24 years of foreign domination in that field. It was an "80" which spanned



the continent from Los Angeles to New York in four hours and thirteen minutes in January, 1946, a record which still stands.

Even today it takes a back seat for no airplane, as it proved in the recent Las Vegas gunnery meet. It is an encouraging commentary on our progress in the field of fighter development that a 600-mile-per-hour airplane must be dropped from the production schedule as outdated.

The "80" was a war baby. In 1943, when the war in both theaters was mounting to a peak, the need for a jet airplane became evident to top brass of the (then) Army Air Forces. The Germans were far ahead of us in jet development with the Messerschmitt 262 and Arado 234, planes with speeds in the 450-mile-per-hour class. The Japs had not actually turned out a jet plane but it was known that they were working in that direction.

So the AAF turned to Lockheed, then established as

one of the top fighter aircraft manufacturers by the performance of the P-38 Lightning, and said, "Build us a jet." And just 143 days later "Kelly" Johnson, Lockheed's chief research engineer, delivered the XP-80 to the Air Materiel Command for flight testing. The abrupt end of the war kept the "80's" out of combat.

While the "80" drops out of the procurement picture, it leaves a trio of descendants to carry on the tradition: the T-33 trainer and the F-94 and F-97 fighters. The T-33 was evolved by elongating the "80" fuselage and adding a second seat for an instructor, providing the Air Force with its first jet trainer.

Strangely, the elongated design proved to have a better performance than the original, so it was decided to carry the development a step further; radar equipment for night and all-weather work was installed in the nose of a two-seat version and the F-94 was born.

The F-97 is the latest of the family. It was developed by taking the basic F-94 airframe, substituting a new, high-speed thin wing and exchanging the Allison J-33 engine for a new, extremely powerful jet, the Pratt & Whitney J-48. For still more power an afterburner was added. The F-97 was ordered into production this year, and with first deliveries scheduled for 1951, it is a cinch that modified versions of the "80" will be flying 10 years after the first flight of the prototype, a real design achievement in these days of rapid obsolescence.

Supersonic General

THE NUMBER of pilots who have flown faster than sound is still a fairly exclusive society, but to Brig. Gen. Albert Boyd, who commands the Air Force's desert experimental flight test center at Edwards AFB, Muroc, Calif., goes the honor of being the only supersonic general. The Air Force confirmed the other day that Boyd had exceeded Mach 1 in the Bell X-1 special research airplane.

Boyd is no Sunday pilot, but perhaps the Air Force's top test pilot. It was he who flew the F-80R, mentioned earlier, when the U. S. recaptured the world speed record in June, 1947, with a 623.8-mile-per-hour average, since eclipsed. Until he took over his present command, Boyd was chief of Air Materiel Command's Flight Test Division. Now 40, he has more than 20 years Air Force service.

A total of 12 pilots have topped Mach 1 in the X-1; 10 of them are still living. Capt. James T. Fitzgerald of the USAF and National Advisory Committee for Aeronautics test pilot Howard C. Lilly both joined the select group before they were killed in crashes; strangely enough, neither was injured in the X-1.

The rest of the list includes Boyd, Capt. Charles E. Yeager, the first supersonic man, Majors Richard L. Johnson, Frank K. "Pete" Everest, Gus Lundquist and Jackie Ridley, and Lt. Col. Patrick D. Fleming, all of the USAF, and NACA pilots Herb Hoover, Robert A. Champine and John W. Griffith.

MATS Mission Shifted; Air Transport Activity Cut

ONE OF the world's largest airlines has gone out of the air transport business. The Military Air Transport Service has received a directive from the Department of Defense which will cause immediate termination of all scheduled passenger flights within the U. S. and discontinuance or reduction of scheduled flights to certain South American points.

From now on MATS' primary mission will be training instead of transport, and transport service will be limited to the by-product lift produced in carrying out the training mission. MATS will be charged with the maintenance of a military airlift force and an overseas route structure which may be rapidly expanded to meet M-Day requirements.

The revision of MATS' mission will probably cause little grief in the airline industry, since a number of top carrier executives felt that MATS' far-flung transport routes provided a source of competition. The recent South American argument between the airlines and MATS has also been settled by the directive.

When MATS announced early this year that it would run regular schedules to both coasts of South America, airline officials went up in arms, feeling that the service was directly competitive with commercial carriers operating the same routes. Under its revised mission, MATS will cancel its semi-monthly west coast flights to Santiago, Chile, and east coast flights will be cut to two a month, terminating at Rio de Janeiro instead of Buenos Aires.

The reorganization also cancels out all MATS' scheduled cargo flights in the U. S., except a run from Westover AFB, Mass., to the West Coast via a number of Air Materiel Command depots. Feeder transport, from AMC depots, is also eliminated.

Since training is now the prime mission, MATS will maintain its overseas routes for mobilization use and familiarize crews with the routes. MATS will train nearly double the number of crews it has been training.

The revision of MATS' mission will undoubtedly result in new military passenger business for the airlines, but the Air Force has no estimates as to how many personnel formerly carried on MATS planes will now use commercial transportation. MATS flew 81,000,000 passenger miles in 1949.

Chief reasons for the reorganization were an economy study by the Department of Defense Management Committee (McNarney Committee) and the realization that MATS personnel were not getting proper training for war-time assignments by flying short domestic passenger trips.

Production Spotlight

Appropriations: The fiscal 1951 military appropriations bill is now before the Senate, after a \$300,000,000 boost over the amount recommended by the President for aircraft procurement passed the House of Representatives. If the Senate passes the bill in the same form, the two air services will be able to buy a total of 2,372 new aircraft (1,460 Air Force, 912 Navy) in 1951, compared with 2,048 during the current year.

Martin 4-0-4 Loans: The Glenn L. Martin Co. has arranged loan credit totaling \$18,000,000 to finance production of the 65 4-0-4 twin-engine transports recently ordered by Eastern Air Lines and Transcontinental & Western Air. Martin received an additional credit authorization of \$13,000,000 from Reconstruction Finance Corp. and Mellon National Bank and Trust Co. of Pittsburgh, Pa., agreed to lend the other \$5,000,000. Martin has not yet drawn on the new credit authorizations, but if the company uses the total amount its overall debt will be \$21,000,000, since a \$3,000,000 balance still remains on previous RFC loans.

Thin-Wing Fighter: Lockheed Aircraft Corp.'s latest fighter, the F-97, a thin-wing two-seat version of the basic F-80 design, has returned to the plant for tail modifications following a series of test flights at Edwards AFB, Muroc, Calif. An indication that the new thin wing will be highly successful is the fact that the plane reached a speed of Mach .91 (91% of the speed of sound) during the first series of tests. The tail modification is expected to add to the F-97's speed capabilities. The plane is powered by a Pratt & Whitney J-48 jet engine equipped with an afterburner.

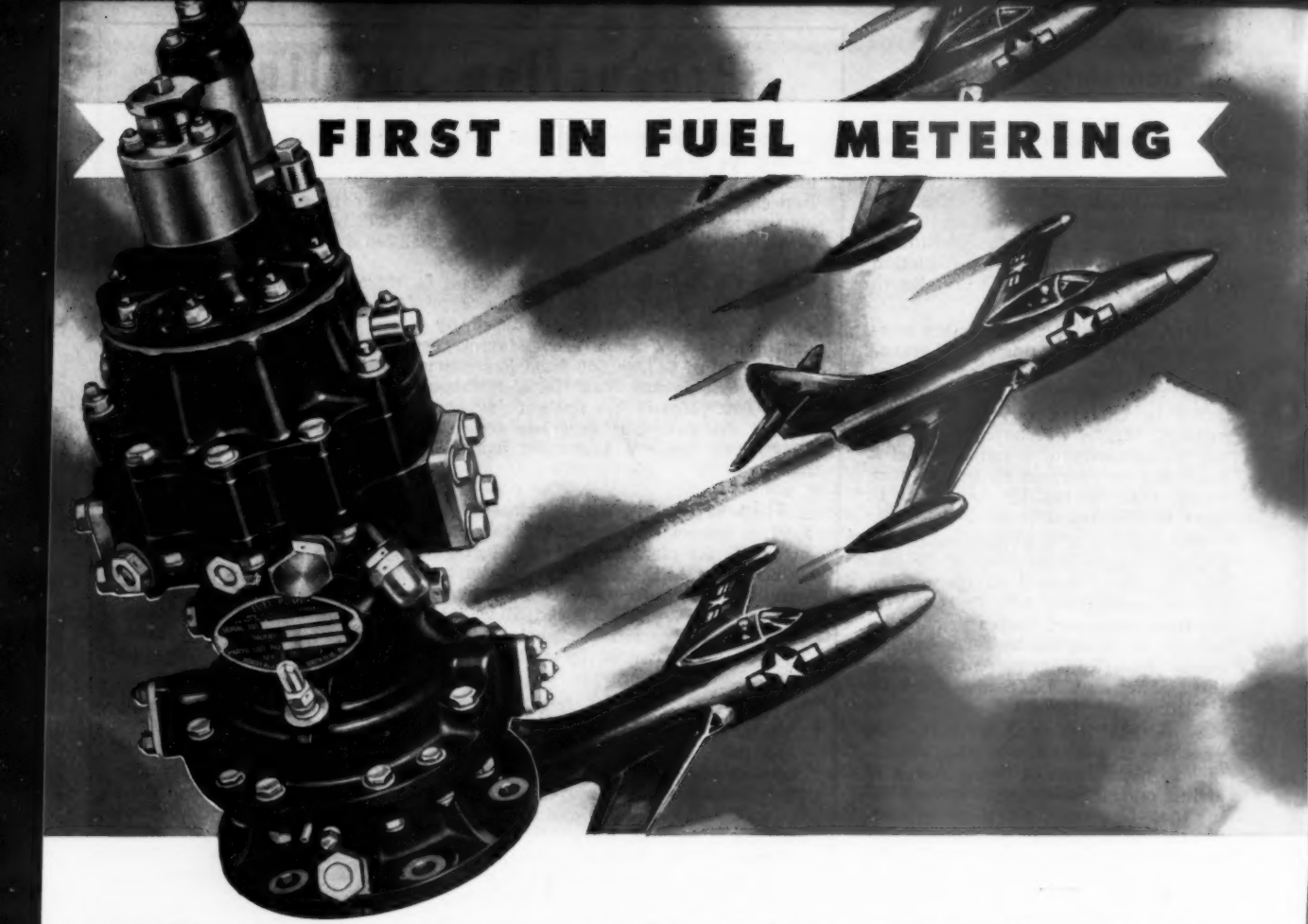
106 Miles Up: The Navy's Martin Viking rocket has set a new altitude record for a single-stage American-built guided missile. Fired from the deck of the Navy guided missile ship USS Norton Sound in the mid-Pacific, the Viking reached an altitude of 106.4 statute miles. The previous record for single-stage rockets was 78 miles, although two-stage rockets (in which one rides piggy-back atop another until a certain altitude is reached, then takes off on its own) have ascended as high as 250 miles. The Viking is a 50-foot pencil-like missile with a diameter of 30 inches. It is powered by a 20,000-pound-thrust rocket engine built by Reaction Motors, Inc., of Rockaway, N. J.

Damaged Delta: Consolidated Vultee Aircraft Corp.'s XF-92A delta-wing experimental Air Force fighter was damaged during a recent test flight at Edwards AFB, Muroc, Calif., when its Allison J-33 jet engine failed just after take-off. The plane was about 20 feet in the air at the time and the landing gear had just been retracted. **Capt. Charles E. Yeager**, the pilot, tried to lower the gear but was unable to and had to make a belly landing. A partially-lowered nose wheel absorbed some of the shock and the plane was not too badly damaged. Yeager was shaken up but uninjured. A Convair crew will inspect the damage and repair the plane at Muroc if possible; otherwise it will be trucked to Convair's San Diego plant for repairs.

Ram-Jet Test Chamber: Until now ram-jet test work has been hampered by the lack of facilities for testing large engines, but the Navy has now started tests of large-scale ram-jets at simulated altitudes of 100,000 feet and at speeds up to Mach 4 in a newly completed test chamber at the Ordnance Aerophysics Laboratory at Daingerfield, Tex. The new chamber permits testing ram-jets as large as 48 inches in diameter; heretofore the Navy has been able to test large ram-jets up to altitudes of 20,000 feet and small ram-jets (six inches in diameter or less) at higher altitudes. The Daingerfield chamber is 10 feet in diameter and 125 feet long, with a 30-foot side door through which the engines are installed. It is operated for the Navy Bureau of Ordnance by Consolidated Vultee Aircraft Corp., under the technical direction of the Johns Hopkins Applied Physics Laboratory.

Design Tests: The Air Force will start a flying evaluation of three new jet fighter types at Muroc on June 1. The competitors are the **Lockheed XF-90**, the **McDonnell XF-88** and the **North American YF-93**. It is still uncertain whether a production order will go to the winner . . . The USAF will also hold a design competition in the near future for a new high-speed interceptor fighter.

—J. J. H.



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World's Smallest Gas Turbine . . .

. . . 60-hp AiResearch auxiliary powerplant

By RICHARD G. WORCESTER

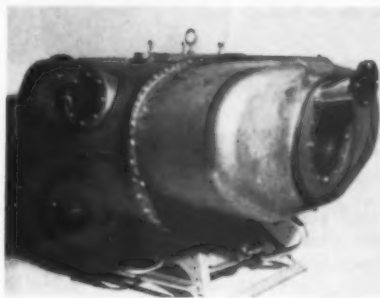
OF THE several hundred different products made by AiResearch, the one which is in many ways most interesting is the 60-hp gas turbine and its attachments which comprise a comprehensive set of auxiliary power.

The equipment includes the AiResearch GTP which is the gas turbine shaft power unit. This weighs about 97 lb. (dimensions 38 x 17 x 27 inches) and may be used for driving an 800-amp DC generator making a total weight of 200 lb. The GTP can be used for driving pumps or electric power sets.

Compressed air tapped from the two-stage centrifugal compressor of the GTP can be piped to the AiResearch GTC bleed unit which may be used as a source of compressed air or for air conditioning the cabin. The bleed-off can be used for the ATS Pneumatic Starter. The bleed unit weighs 88 lbs., or 150 lb. with controls (dimensions 27 x 24 x 28 inches).

This article is mainly concerned with the development of the gas turbine unit itself. Several dozen engines have been built and the U. S. Navy, which sponsored the GTP, has observed a 500-hour endurance run. The gas turbine is a single-speed engine running at 40,000 rpm. It is started by an electric motor and a simple on-off push-button control. The engine can be easily mounted in the rear fuselage or even slung in a cradle.

Nearly all the technical difficulties



Power Package—Enclosed in this envelope the AiResearch gas turbine auxiliary engine has remote control on-off push buttons and operates at a single speed of 40,000 r.p.m.

involved in this size gas turbine spring from the losses which result from scaling down the components. This, coupled with the concept of an on-off engine running without attention, has set the development in a class by itself. Thus AiResearch has encountered all the problems and limitations in any gas turbine and also faced up to the special quirks which arose in the engineering of the smallest gas turbine so far announced.

Probably the most critical single aspect of the engine is the difficulty of keeping the hottest part of the combustion system away, physically, from the rear bearing. The radiation from the tail section of the combustion chamber running at red heat elevates the bearing temperature and makes it difficult to retain an oil film.

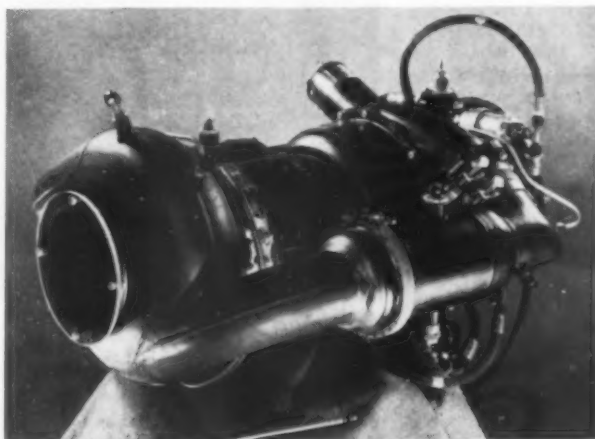
From the design standpoint the innovation of the engine lies in the radial type turbine—for which the company is claiming an efficiency of over 80%. The alternative of using an axial turbine with cast blades and wheel integral would bring the combustion chambers nearer than ever to the turbine rear bearing.

The circuit is as follows: air is drawn in from the center of the engine and passed to a two-stage centrifugal single-sided compressor passing up the forward face of each. Compressed air is flung outwards and back through a magnesium alloy diffuser and divided into the two combustion chambers where it is ignited in a burner of conventional design. The gas is led through a scroll type of inlet to the turbine and passed inwards to the turbine wheel itself. Low pressure gas emerges behind the wheel.

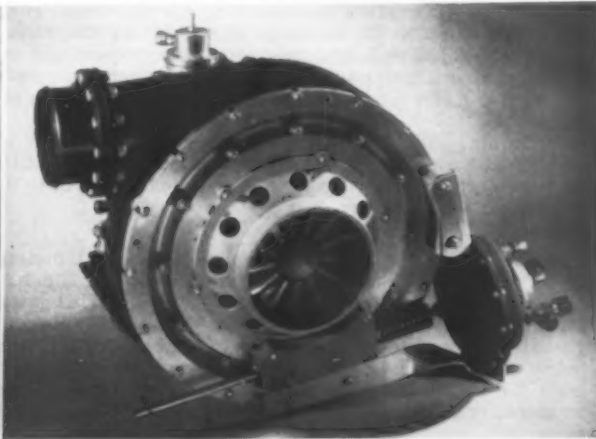
Service Advantage

The turbine wheel drives both the compressor stages all bolted together on the same shaft and the drive is continued through a sun and planet reduction gear. The turbine, compressor, combustion systems, and accessories are designed as interchangeable assemblies which involves a weight penalty but will be of assistance in servicing the engine.

Much basic information on the use of auxiliary gas turbines on pneumatic power installations in aircraft is contained in an SAE paper by H. J.



Auxiliary Equipment—On the left is the AiResearch 70-shaft-hp small gas turbine with a centrifugal compressor, reverse flow through two combustion chambers and a single-stage radial turbine. On the right is the air



turbine alternative drive which is used as a component in the pneumatic system to start the main engines and to run the accessories of an aircraft. This equipment is used on the Convair XP5Y-1 flying boat.

Design Trends

By Richard G. Worcester



IT IS REVEALING to trace the changing pattern of structure materials and fabrication methods which have been adopted to meet the mounting speeds possible with modern jet engines and rocket propellants. The Lockheed F-80 and Gloster Meteor remain typical of the World War II era; not only the materials but the way they are used follow orthodox lines. This merges into what might be called the early transitional stage represented by the North American F-86 in which 75 ST alloy is used more freely and a higher degree of precision along the wing has been realized. In Britain the Gloster E1/44 with a solid steel spar also falls into this evolutionary period. There is a novel approach in the Boeing B-47 in which the less rigid structure is used and the flex can be made to work as a friend at high mach number. However, the amplitude and kinetic energy distribution of large air flow disturbances on this structure have produced some startling effects and Boeing would probably be the first to agree that there is still much to be learned about how far this promising method can be applied in the B-52.

The latter transitional period can be seen in the Convair F-92 delta wing where the triple spar structure has the minimum of flex. Light alloy have been generally used but the geometric form of the delta affords the basis of a very firm envelope. And this merges into what we in our omniscience choose to call the fully developed stage as represented by the Bell X-2 and other aircraft where major assemblies are machined from bulk stainless steel and where ultimately, no doubt, the one-piece titanium structure will have even smaller elongation and even larger ultimate stresses and thus constitute the unyielding platform (the "jaws of death") which according to many—but not all—sliderules is the correct formula for sonic safety.

The existence of Edwards (Muroc) is a mixed blessing. It is wonderful to have such a mighty expanse, but designers keep building aircraft which seem unable to operate anywhere else. Many people would feel a lot more secure if one of these 7,000-lb. jet engines were fixed into a fighter with a wing loading of 30 lb./sq. ft. An aircraft which could make tight turns at 70,000 feet and fly rings around any jet bomber at 50,000 feet would be more valuable than some of our tree top racers. Suppose the Russians put up a bomber version of the Comet cruising at about 47,000 feet we could fly a few aircraft into the vicinity but they would not be able to fight. There is, however, one intriguing advantage of the delta and swept wing at extreme altitude. These wings flying at say 140 mph IAS (the stall would be 130 mph and compressibility perhaps 150 mph IAS) would have a very high angle of attack, say about 20 degrees in level flight. So if the bomber was flying above and out of reach the fighter would be positioned right longitudinally for gun firing. But this small advantage should not obscure the real issue which is that, although there is a place for delta wings in medium-high altitude supersonic interception, there is a crucial need for the U. S. to develop a proper high altitude fighter.

It is a lively Washington parlor game to try and envisage the most formidable type of attacking aircraft. My suggestion is a delta wing bomber with a low wing loading cruising at 60,000 feet flying at precisely M 1.0. In the turbulent transonic region no fighter—whatever its geometric shape—would stay still long enough for the pilot to take aim. The bomber would fly either below or above sonic speed according to its capabilities while flying to and from the target and when molested its defense would be to retire into the transonic region.

In the table of mach number limitations which was published in this section a fortnight ago a friend has pointed out the position of the World War II fighters. Where is this position? Among the transports four places from the bottom!

Wood and F. Dallenbach. There it was stated that the oil tank, oil cooler, remote push-button control, fully automatic operation, safety devices and firewall protection added up to 70% of the weight of the engine. This shows clearly the price to be paid for scaling down.

The gas turbine would use fuel from the main engines and AiResearch summarize its fuel consumption by saying that at the present time the gas turbine holds a definite weight advantage over the piston engine for intermittent duty. For continuous duty the lower fuel consumption of the piston engine at part loads makes the overall weight, including fuel, lower on long flights.

Intermittent Use

The company, by using equipment such as a thermionic valve fuel control, might be able to reduce the fuel consumption. In any case it is fair to say that in practice auxiliary motors are not used continuously. The noise level of the gas turbine is reported to be high, but experience with piston engine auxiliary motors indicates that, if AiResearch has a noisy auxiliary motor, it is not the only sinner.

Adding it up we can say, first, that if the aircraft designer decides to use a gas turbine auxiliary the formula of using a shaft power unit and a bleed-off is the most flexible system and will make practicable the all-pneumatic servicing system. The pros and cons of the gas turbine over the piston engine are plainly laid out. There is no mystery about them and some designers will want one type while others will need the other. But AiResearch has put the auxiliary turbine squarely in the field.



Boeing 502 Rotor—First picture of the main rotating component in the Boeing 502, 175-shaft-hp small turbine, shows the one-piece shaft coupled to a single-sided centrifugal compressor and its turbine. A mechanically independent second-stage turbine drives the reduction gears. The engine could be used in any lightplane with a pusher geometry.

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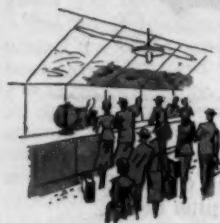
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And, in Contrast . . .

Northrop's 7,500-ehp Turbodyne Engine

Early details of the Turbodyne left the impression that Northrop's engineers had embodied some radically new principles in this engine—the second most powerful in the world to be announced (Wright's 10,000-hp Typhoon project is still the largest ever).

In fact, so far as the gas generation is concerned, the Turbodyne reveals itself as a strictly conventional piece of turbine machinery and superficial examination of the engine (which is all that the USAF will permit at the present time) fails to throw up a single unfamiliar feature.

The novelty of the engine undoubtedly rests in, first, the successful development of such a huge axial unit and the difficulties of using large components must have been considerable. Second, the main interest technically rests in the proposal to extract power for the propeller either from the intake end in a tractor layout or at the exhaust nozzle end as a pusher and allowing the waste gas to escape as jet thrust through a hollow spinner of the propeller.

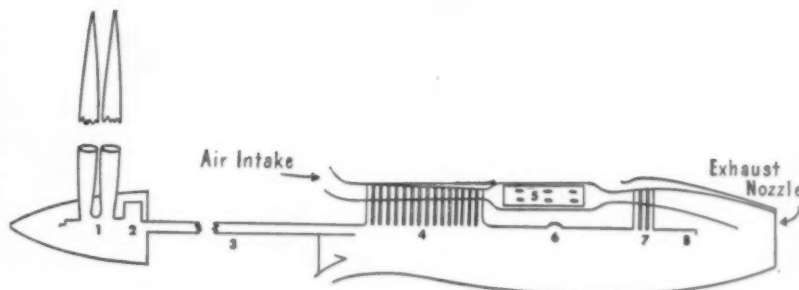
The fundamental disadvantage of the single very powerful turbine lies in the loss of operational flexibility. The gas turbine has proved itself to be inherently rigid and exacting in its functioning and the trend is towards smaller coupled engines which restore in some measure this deficiency by shutting down the unwanted engines in flight, leaving others still running at full permitted power.

Needs Large Airplane

Unless a stupendous aircraft is contemplated for the Turbodyne this giant engine is going to be a bit of a handful for any airframe designer. The most obvious use for the engine is in the nose of a 65,000-lb ship-based strategic atom bomb carrier.

Although the Navy has shrewdly sponsored nearly every American gas turbine from the Allison T-40 to the AiResearch midjet, it is, paradoxically, the USAF which is interested in this engine. So two Turbodynes might be used in a 100,000-lb ground attack aircraft where the low altitude operation would suit a propjet better than a pure jet.

About a dozen Turbodynes have been built and run, and one has completed a 50-hour endurance test. The



Turbodyne Schematic—This diagram of the 7,500 equivalent hp Northrop Turbodyne shows: 1. Aeroproducts contra-prop; 2. reduction and contra gears; 3. extension shaft; 4. 16-stage axial compressor; 5. parallel-sided combustion chambers and burners; 6. shaft coupling break; 7. three stage (three wheel) turbine; 8. alternative extension shaft for pusher propeller arrangement with jet gasses emerging from the hollow spinner.

internal design is not in any way sealed and the following details of the engine should be regarded as a general indication of Northrop thinking rather than a series of positive assertions.

General Construction

A simple, light alloy annular intake is used which passes inlet air to the 16-stage axial straight flow compressor. The air is passed through a diffuser to parallel-sided combustion chambers where the gases are burned in burners of conventional length. We guess the pressure ratio is about 5:1.

The three-stage turbine has a big diameter—as might be expected—but although the blades are large, ordinary high-cobalt steel alloy materials have proved satisfactory. The choice of materials for the blades on the compressor and turbine, together with the castings in the low stressed places in the engine are all conventional. No novel free turbine arrangement is employed and the turbines drive the compressor and reduction and contra-gears as a single rotating component.

Two minor features of the engine are worth special mention. The absence of external cooling air ducts of tapped air from the compressor suggests that the face of the turbine wheel and the turbine bearing are cooled by ducts within the compressor drum. Any maintenance job required along the length of these air

supplies would involve pulling the engine apart almost at the last nut and bolt. Whether this is a practical feature remains to be seen. On the face of it, this seems risky.

It has one bright advantage, however, that in this way the pipes are bound to be farther from the combustion chambers and so the air will arrive at its destination cooler. The British method of keeping the pipes outside and making them dive between the combustion chambers is a definite policy.

Light Alloys

The other feature is the use of light alloy combustion chambers. If this becomes standard Northrop practice they are to be wholeheartedly congratulated. To use mild steel in any component which can be made in light alloy is to display your ignorance and if Northrop or anybody else can get away with light alloy in this part of the engine they have got some pretty advanced ideas. If the rest of the Turbodyne is the result of similar thinking it is a hopeful augury for the future.

The Turbodyne drives an Aeroproducts eight-bladed contra-prop. Aeroproducts has therefore even more incentive to make a really good job. This country does not want a propeller for these big engines, but a turbine propeller. It is satisfactory to know that Allison, Aeroproducts and Northrop must march forward in step.

The story of the

In this day of specialists, we'd like to tell you about a 6-in-1 man. He's a technical adviser, engineer, liaison officer, mechanic, educator, expeditor, in one neat package labeled "Chance Vought Field Service Representative".

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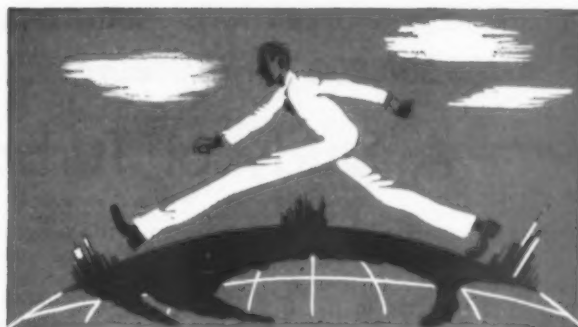
Corsair, Pirate and Cutlass fighters. And every day he uses that special knowledge to maintain the 33-year tradition of Vought dependability, availability and fly-ability. To Navy and Marine fliers and ground crews, this 6-in-1 specialist is Chance Vought.

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After 500,000 Flight Hours . . .

A Study of Turbojet Overhaul Experience

By WILLIAM D. PERREAULT

WHAT IS the status of the turbojet engine in the U. S. insofar as servicing problems are concerned? Recently John W. Bailey, head of Allison's engineering service section, presented some interesting facts about this aspect of Allison J-33 and J-35 service experience to the Society of Automotive Engineers.

The J-33 has been under development and production since 1945. In this five-year period the engines have accumulated about 400,000 flight hours. Through refinement and redesign J-33 thrust output has been increased 41%, weight decreased 8% and fuel consumption decreased 9%.

While these improvements were being achieved, the actual overhaul life of the engines increased by 1700%. This is indeed startling. But it's even more so when Bailey cites today's average accomplished overhaul periods on this engine as only 150 hours.

Progress has been swift, but where are we today? Bailey feels that a comparison of air miles between overhauls is a helpful criteria to measure the comparative status of turbine and reciprocating engine development. He cites figures which show that after three years development the J-33 produced, in military fighter operation, about 24,000 air miles between overhauls as compared with some 48,000 miles for the Allison V-1710 reciprocating engine at a comparable period.

Closing the Gap

At the end of four years' production the J-33 was up to 45,000 air miles between overhauls and the V-

1710 at 78,000 miles. At the end of five years the figures were 80,000 air miles for the J-33 and 100,000 for the V-1710. The gap was rapidly closing.

The J-33 is a centrifugal-flow jet engine. What of the axial flow types? The J-35 falls in this category. It is now three years since start of development on the J-35. During the ensuing year some 100,000 flight hours have been accumulated, there has been a 43% decrease in unit price, 31% increase in thrust, 8% decrease in weight and 3% decrease in fuel consumption at cruise.

Meanwhile there has been a 1200% improvement in average accomplished overhaul periods for the J-35. In mid-1948 actual monthly average operating time was about 25 hours. Just recently the monthly average exceeded 100 hours. This means that a good many engines exceeded 100 hours and many others didn't reach that time.

More Experience

No small part of these improvements can be accounted for by increased know-how. As will be cited later, design refinements accounted for many improvements. But knowledge of allowable tolerances appear to be even more important. Not knowing the true significance of various cracks, dents, nicks, distortion, etc., the service activities were playing safe and changing engines.

The ability to perform an increasingly large number of service items in the field will also contribute materially to longer overhaul periods, Bailey said. In this direction the engine manufacturers are working with the Air Force to design their engines for greater serviceability. Typical of

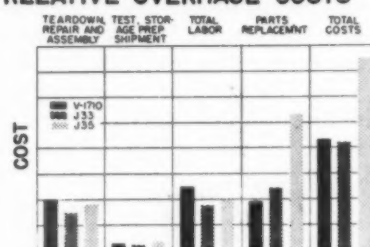
the progress is the fact that individual turbine buckets can now be easily replaced by maintenance activities with "a minimum of tools or equipment and only tail cone removal."

A wealth of information regarding the types of service troubles encountered with both the J-33 and J-35 engines were presented in charts used to illustrate Bailey's discussion (see cuts).

Design Refinements

Service problems with the J-33 engine relating to the use of the cast turbine buckets, nozzle diaphragm difficulties, inadequate lubrication of the accessory drives and development

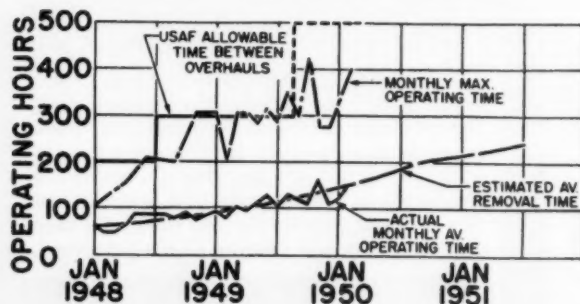
RELATIVE OVERHAUL COSTS



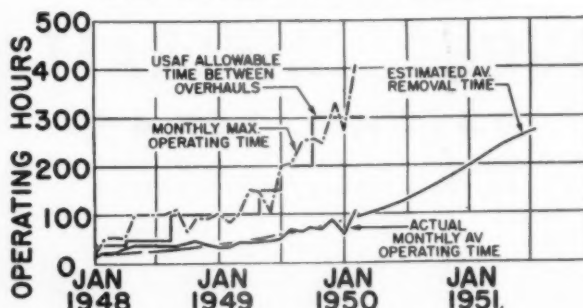
of engine controls have brought about many design refinements. It might reasonably be expected that this would present a serious problem of interchangeability of parts between engine types.

Actually, Bailey said, "of the total number of serviceable parts (exclusive of the fuel control system) used in the latest J-33 model, 54% are interchangeable and usable in the first J-33 engine built."

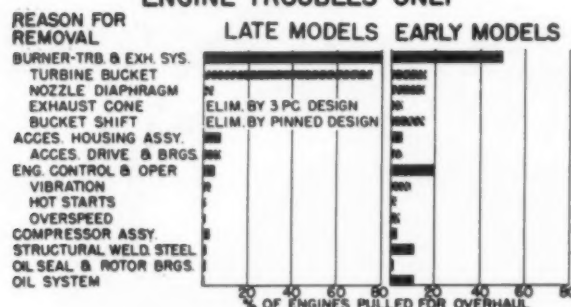
OVERHAUL TIME SUMMARY J33 TURBO-JET ENGINE



OVERHAUL TIME SUMMARY J35 TURBO-JET ENGINE



J33 ENGINES REMOVED FOR OVERHAUL ENGINE TROUBLES ONLY



With the J-35 axial flow engine, based on three years service experience, marginal lubrication of the compressor and turbine rotor bearings has been the cause of most problems resulting in engine removal. When the lubrication breaks down, general roughness, vibration and other parallel effects follow bearing failures. Needed most are "refinements in dimensional control of bearings, the configuration and anti-friction treatment of bearing retainers and the clearance requirements for bearings of the type not previously needed in commercial aviation."

It's interesting to note that a change from cast turbine buckets in the J-33 to forged buckets in the J-35 virtually eliminated this source of trouble. The trend to field replacement of buckets further minimizes the importance of turbine buckets as a cause of engine removal.

Major J-35 Problem

As in the J-33 engine, nozzle diaphragms are a major problem in the J-35. Improvements have been made but the high operating temperatures of the diaphragm, "temperature distribution variation and associated distortion" leave much to be desired. Through design refinements combustion burner liners have shown improvements so that 200 hours of operation can be obtained with a minimum of trouble. In both cases re-

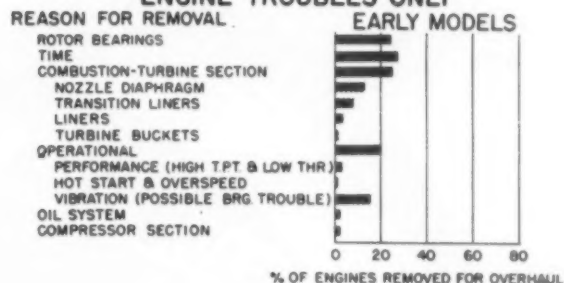
laxation of inspection limits, based on service experience, has improved overhaul life.

Many changes have been made in the J-35 as dictated by service experience yet 41% of the serviceable parts, again exclusive of the fuel control system, in the latest J-35 engine are usable in the early models.

Provision of automatic fuel system operation presented serious problems as the simple three section system of the early F J-33 engines proved inadequate to take care of the overspeeding, altitude compensation and errors in pilot starting technique. To overcome this Allison turned to an automatic system with resulting complexities. Bailey said that refinement of control scheduling and inter-control sequencing proved the major problem in this style arrangement but results have been generally satisfactory. This has been in operation for two years.

Service inspections of turbine engines have been particularly important in the turbine section along with checking of fuel and oil filters and ignition. Particularly encouraging was Bailey's promise of combustion chambers which will go the entire engine overhaul period without removal for inspection. Combustion chamber inspection generally requires the removal of the engine from the aircraft.

J35 ENGINES REMOVED FOR OVERHAUL ENGINE TROUBLES ONLY



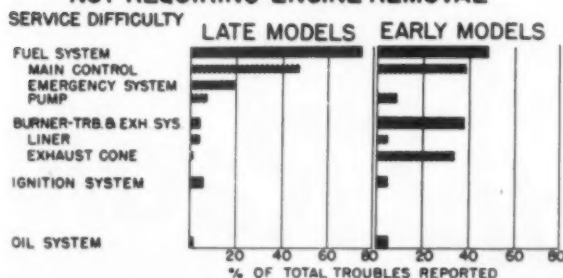
Among the Suppliers

L. E. Jordan has resigned from the Melvin F. Hall Co. of Buffalo to accept a position as general sales manager of **Scott Aviation Corp.**, Lancaster, N. Y. . . . Both general offices and manufacturing operations of **Puroator Products, Inc.**, manufacturers of filtration equipment, are now located in the new plant at 970 New Brunswick Ave., Rahway, N. J. . . . All directors of **Stewart-Warner Corp.**, Chicago, Ill., were re-elected at the recent annual meeting of stockholders.

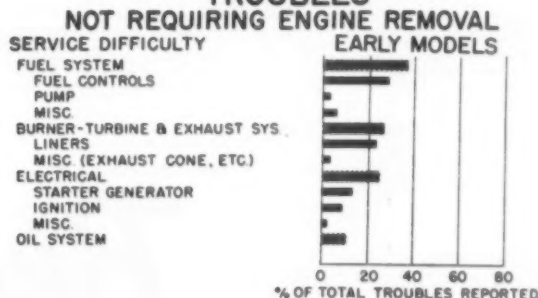
Minneapolis-Honeywell Regulator Co. is planning immediate construction of a new building in Minneapolis to house its aeronautical engineering department. The two-story reinforced concrete and brick structure will contain 80,000 square feet, with footings for an additional story of 40,000 feet.

Aeroproducts Division, General Motors Corp., has established offices in Washington, D. C., and Los Angeles, Calif. The Washington office, located in the Hill Bldg., will be under the direction of **Charles H. Kenerson**, and **R. R. Trost** will head the California office at 7046 Hollywood Blvd., Hollywood. . . . **Van Dusen Aircraft Supplies, Inc.**, of Min-

COMPARISON OF J33 SERVICE TROUBLES NOT REQUIRING ENGINE REMOVAL

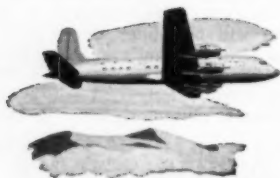


COMPARISON OF J35 SERVICE TROUBLES NOT REQUIRING ENGINE REMOVAL



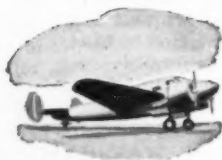


Whatever the Plane or Purpose...



PERFORMANCE

Every major airline relies on Bendix Radio communication and navigation equipment—a preference based on sterling performance under every conceivable flight condition in all parts of the world.



FLEXIBILITY

Buying job-designed Bendix Radio allows you to choose for yourself, from a single reliable source, any type of installation, or any combination of equipment—because Bendix Radio builds a complete line of aviation radios.



ECONOMY

For the private flyer, Bendix Radio builds airline quality equipment at prices exactly proportioned to every job and every purse—from a small battery-operated receiver on up.



ADVANCED DESIGN

In the present defense program, Bendix Radio is engaged in helping to find answers to completely new problems. Bendix Radio builds equipment for America's newest Air Force planes.

Bendix Radio is

...DEMONSTRATED SUPERIORITY— Before the World's Most Demanding Radio Audience!

One of the surest ways to get solid, factual information about aviation radio equipment is to talk to the pilots, operations personnel, and radio technicians at any large airport. These are the men who really *know* radio—know it, literally, from the ground up. It would seem more than mere coincidence then, that these very men display a decided preference for Bendix Radio. They may not be aware of the fact that Bendix Radio has the largest, most modern plant in the industry, or that Bendix Radio pioneered G.C.A. Radar, V.H.F. Omni Range Navigation, and other developments, but these men *do* know that for dependable performance *anywhere* under *any* conditions, you just can't beat Bendix Radio equipment. And remember, they have had plenty



of opportunities to form that opinion, because more planes fly more miles with Bendix Radio than any other make. Whether you want a tiny range receiver or a complete airport installation, take the advice of experts—specify Bendix Radio.

VHF Transmitters • H. F. Transmitters • Radio Control Panels • Antennas • Indicators
Automatic Radio Compasses • Marker Beacon Receivers • Announcing Systems
VHF Communication and Navigation Receivers • Inter-Communication Systems
H. F. Receivers • Radio-Magnetic Indicators • Ground Controlled Approach Landing
Systems • Flightweight Personal Plane Radios • VHF Omni-Directional Range Systems

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P.S.
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economy-packaged VHF Ground
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Technical News Digest

• **NACA engineers have converted one of the Lockheed Constitutions** into a flying laboratory to conduct tests to determine the modifying influence which size may have on the changes in tail loads resulting from abrupt control motions. Current information on aircraft tail loads experienced during flight has been based upon tests conducted on relatively small airplanes and some question remains as to its applicability to airplanes of the size of the 160,000-pound Constitution.

• **Members of The Institute of Navigation** attending the annual meeting scheduled in San Diego June 29 thru July 1 will have an opportunity to take a one-day cruise aboard the U. S. Navy aircraft Carrier "Philippine Sea" and witness deck landings by jet aircraft. Technical sessions are being held in the El Cortez Hotel.

• **Northwest Airlines is installing a new type screen** between the layers of cabin windows to reduce glare and keep cabin temperatures to a minimum. The new screen is constructed very much the same as common venetian blinds, only in miniature. The screen will restrict visibility to some degree but NWA will make a survey of passenger reaction during the service test period to determine the advisability of fleet-wide use.

• **Tests to determine the exact relationship** between air turbulence and aircraft operation are now being conducted in the area of Brookhaven National Laboratory on Long Island. The tests are being made by NACA using a small Air Force airplane with provisions for recording aircraft speed and acceleration in time, correlated sequence with recordings of air conditions made on a 420 foot tower at the laboratory.

• **CAA has issued a revised copy of Technical Standard Order C-11** outlining the performance requirements for aircraft fire detectors.

• **General Electric has developed a water-cooled, 12-foot periscope** for observing the exhaust of jet engines during tests. Image of the burning gases is transmitted through the steel tube to observers by means of a conventional optical system. The viewer's end of the periscope includes a 16-millimeter motion picture camera, an eyepiece for an observer, and a large television-like screen which several persons may watch.

• **The first helicopter in the world** to pass the 3,000 flight hour mark was an Sikorsky S-51, NC-92813, owned and operated by Los Angeles Airways since the fall of 1946. The plane logged its 3,018th hour early in April. Several other helicopters in LAA's fleet are approaching this mark.

• **The second non-stop flight from Paris to New York City** in commercial aviation history was made on May 12 when an Air France Constellation made the 3,850-mile flight in 16 hours and 40 minutes. The first non-stop flight was a Lockheed 049 Connie which made the flight in 16 hours and 2 minutes on April 28, 1946.

• **Butler-Zimmerman, Inc., specialists in the field of aircraft interior design,** have been retained by The Glenn L. Martin Co. to assist in the design of the cabin interiors for the Martin 4-0-4's now on order by EAL and TWA.

• **Chance Vought Aircraft Division has designed a fuel test laboratory** for testing complete fuel systems of high-speed, high-altitude aircraft at its plant near Dallas, Texas.

• **The new pay scale for American Airlines' stewardesses** represents a new high in wage scales for this position, according to the Airline Line Stewards and Stewardesses Association, International. The stewardesses will have a minimum starting wage of \$185 per month and a top of \$275 for stewardesses with more than six years' service. This is about 4% higher than the previous scale.

• **Of 719 cases of persons with air sickness** on American Airlines' flights who were treated with dramamine, better than 80% enjoyed complete or partial relief according to AA medical officials. 8-10% of the group had mild side-reactions, mostly drowsiness.

neapolis, has been appointed distributor for aircraft tube fittings, valves and other products of the Parker Appliance Co., Cleveland, and will represent Willson Products, Inc., Reading Pa., in a special line of pilot glasses.

G. deFreest Lerner, executive vice president and general manager of **Anken Chemical and Film Corp.**, Newton, N. J., was elected to the newly created position of chairman of the board of **Robinson Aviation, Inc.**, Teterboro, N. J. Robinson, manufacturers of vibration and shock mounts, also elected a new board of directors consisting of **C. S. Robinson**, president; **D. H. Robinson**, vice president and treasurer, and **Robert S. Binkerd**. **George A. Viehman** was elected vice president and general manager.

K. A. Vaughan, associated with **Gould Storage Battery Corp.**, Trenton, N. J., since 1928, has advanced to the newly created position of manager of sales engineering. . . . Construction of an applied research laboratory—third unit in the multimillion dollar **B. F. Goodrich Chemical Co.**, installation at Avon Lake, Ohio—was to begin this month. The new one story building will cover 17,500 sq. ft.

Lear, Inc., Grand Rapids, Mich., has announced the election of three new directors and the re-election of **William P. Lear** and **Harold R. Boyer**. The new directors are **Dean C. Smith**, director of contracts, Hughes Aircraft Co.; **Dr. Russell A. Stevenson**, dean of the School of Business Administration, University of Michigan; and **John W. Dregge**, executive vice president of Nichols & Cox Lumber Co. and vice president of Wood Tile Corp., both of Grand Rapids, Mich. At the end of April, Lear had a backlog of unfilled orders totaling \$9,600,000.



Radio-Active—This is the new method being used by British scientists for transporting radio-active isotopes from Britain's atomic pile at Harwell, Berkshire, to their destinations. The isotopes are brought to the airport in lead boxes and transferred to the compartment in the wing tip by means of a long handled rod. The system originated at the National Physics Laboratory in Pretoria, South Africa.



What's the success secret of Shell Airport Dealers?

One Example: Shell's **PLANNED UPGRADING** of aircraft fuels and lubricants...

PLANNED UPGRADING of fuels is shown in the new *Shell 80/87 octane fuel*. This 80-octane fuel with a guaranteed minimum rich mixture rating of 87-octane was made available by Shell on a nation-wide basis in 1949. It is the fuel which has engine-manufacturer approval for many models in place of 91-octane*.

Planned upgrading is also evident in the many *Aeroshell* Lubricants which meet the most exacting needs of modern aircraft. Such product superiority is the result of looking ahead, of anticipating needs, of continued research on a long-pull basis.

*Write for an up-to-date list of engines for which 80/87 octane fuel is approved by engine makers.



PLANNED UPGRADING is one of the three main runways of "Airport Success" which are:

1. Shell's Planned Upgrading of aircraft fuel and lubricants.
2. Shell's Planned Lubrication service.
3. Shell's Planned Merchandising program.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, N. Y. • 100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

JUNE 1, 1950





The myth of Icarus* indicates that he had little difficulty in flying. But with no way of measuring his proximity to the sun, his attempt proved ill-fated.

So with modern flight. Although man learned to fly shortly after the turn of the century, it was not until the late 1920's

Measure of Safety

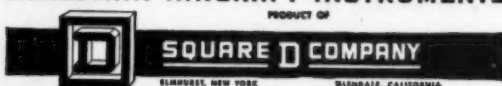
that flying—thanks to precision instrumentation—ceased to be a highly hazardous

adventure and took on the aspects of an exact science. It was at this same time that the name of Kollsman became synonymous with precision flight—a position in the instrumentation field that has never since been challenged.

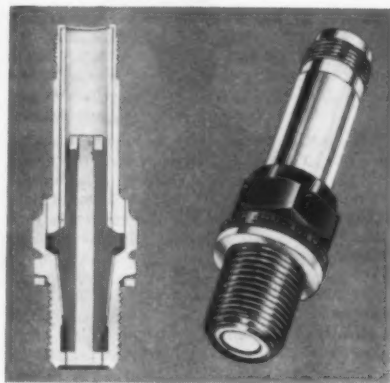
Kollsman inventiveness and engineering skill today continue to pace and anticipate the needs of the aviation industry. In this age of supersonic speeds—when an extreme measure of accuracy is vital to safety—Kollsman instruments unerringly point the way to aviation's illimitable future.

*The ancient Greek who, by flying too close to the sun, caused the wax that secured his feathered wings to melt, whereupon he plunged into the sea.

KOLLSMAN AIRCRAFT INSTRUMENTS



—OPERATIONS-MAINTENANCE—



Three Airlines Testing New Type Spark Plug

Three airlines have been testing the Hahn spark plug, a plug featuring unusually rugged construction in which the center electrode is of annular shape rather than the conventional wire type. The plugs are being produced by Hahn Aviation Products, Inc., in a factory at Philadelphia, Pa.

The three lines service testing the plug are Capital, Colonial and Northwest. Capital has tested the plug in the P & W R-2000 engine on a limited scale but has now ordered several thousand plugs for more extensive evaluation.

To date the CAA-approved Hahn LS702 spark plug has accumulated over 3,600 hours service flight time, according to the manufacturer. As can be seen in the accompanying drawing, the plug uses a heavy duty center electrode with the spark jumping from this to the outer shell. This eliminates the need for adjusting spark gaps and is said to minimize erosion rates.

—TECHNICAL LITERATURE—

FASTENERS: Pheoll Manufacturing Co., 5700 Roosevelt Road, Chicago 50, Ill., has available a 28-page illustrated Sema catalog describing these special industrial fasteners and holding devices in all sizes and types. Included are screws in round, pan, truss, fillister, flat and oval head types with both slotted and Phillips recessed head types.

ARMORED FLOOR: The Master Builders Co., Cleveland, Ohio, has released a 36-page illustrated booklet giving full information on nine features of the Masterplate floor. Masterplate is an iron-clad concrete floor having an armored surface about one-eighth inch thick. Manufacturer claims Masterplate wears five to six times longer than plain concrete floor, is spark resistant, non-dusting, corrosion resistant, etc.

WELDING CHART: Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y., has available a two-color giant wall chart listing over 100 EutecRods and EutecTodes with their standard sizes and considerable related data such as type of joint for which suitable, metal on which used, bonding temperature, tensile strength, Brinell hard-

ness, degree of color match, etc. Requests should be on company letterhead.

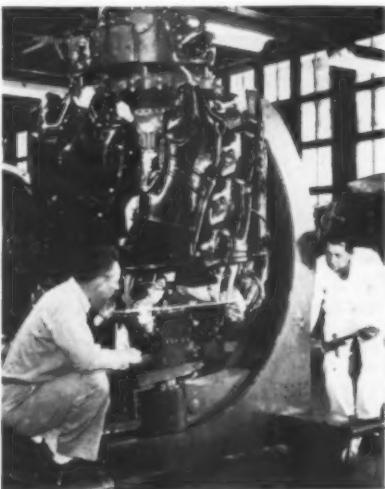
VALVE PUBLICATION: Paul Valve Corp., 683 Third Ave., New York 17, N. Y., has published a 16-page, two-color bulletin describing their complete line of high-performance venturi-ball valves. Included are illustrated principles of operating and engineering data on "whistle" valves, bar stock valves, cast forged and stainless steel valves.

CLAMP CATALOG: Thomas Associates, 4607 Alger St., Los Angeles 39, Calif., has published a new 32-page 1950 catalog covering the complete line of over 12,000 sizes and combinations of standard bare metal and cushioned line support clamps and line support blocks. Included for the first time are five new materials such as conductive, Skydrol resistant, high temperature resistant, etc.

OXYGEN EQUIPMENT: Scott Aviation Corp., Lancaster, N. Y., has published Handbook No. H-33, a 14-page illustrated handbook giving information on all types of aircraft oxygen equipment for supplementary oxygen at high altitude and for emergency smoke or fume protection.

WELDING ELECTRODES: Hobart Brothers Co., Box EW-149, Troy, Ohio, has announced a 16-page illustrated catalog containing data on the application, welding procedure, mechanical properties and specifications of electrodes in the Hobart line.

SOLDER PRE-FORMS: Soldering Specialties, Summit, N. J., is making available a four-page brochure titled "How to Speed Up Soldered Assemblies with Solder Pre-Forms." Brochure widely illustrated to tell the what, how and when of the uses of pre-formed solder shapes. Request should be sent on company letterhead.



Engine Stand—PAA foreman Lloyd Powell, left, looks on while W. J. Booth, Jr., moves the engine by operating the pneumatic control which controls engine movement. The stand, known as the Centilever Power Plant Stand, was built by Whiting Corp. of Harvey, Ill., to handle every type of engine in use by Pan American. Compressed air is used to actuate the stand mechanism to move the engine into a convenient position to accomplish maintenance work. Shown in the stand is the P&W R-4360, nose down.

Extra Section

By William D. Perreault



RADIO mechanics fortunate enough to be working at stations where communications recorders are used, will find their trouble-shooting job much easier. Frank Dyer, Arinc's v.p. and chief development engineer, tells us that radio maintenance men on the west coast are playing back the past tapes to determine the exact nature of complaints written up in the log books. By hearing the exact transcript of the messages made in flight the mechanics are generally able to isolate the trouble with a minimum of delay.

During the recent SAE meeting in New York, Rolls-Royce engineer R. N. Dorey said that men have been fatally injured by being drawn into the intakes of jet engines. A Grumman engineer stated that one employe had gotten too close to the jet pipe and had all the hair on his head burned off. It failed to grow back in and he was fitted for a wig prior to returning to work. On his first day back he got too close to the intake and lost the wig to the engine. He'd been bitten by both ends.

There's been a good deal of discussion regarding the best manner to be used in getting the turbine type transports to the end of the runway with a minimum loss of fuel. Inherent limitations in fuel capacity rule out the simple provision of more fuel placed on board at the ramp. Most discussions favor towing the airplane to the end of the active runway. The number of tow-tugs required for such an operation makes this impractical. It would appear that provision of hydrant type refueling ports supplied by a remote central supply would be more feasible. The trend to high-capacity, single-point refueling systems should cinch this type arrangement.

One interesting discussion at the ATA engineering and maintenance conference related to the part played by engine oils in determining engine overall life. It was concluded that present-day engine oils are not limiting the overhaul life of engines but that development of improved oils might help to extend overhaul life by cutting down on failures which are not now considered as resulting from oil lubricating characteristics. NWA's Ralph Geror mentioned that there should be a continuing effort to develop oils which will withstand high operating temperatures so that eventually oil coolers, temperature regulators and related problems could be eliminated.

It's always surprising to walk through a radio factory production line, as we did at Wilcox Radio recently, and see the high percentage of women employed. About 50% of Wilcox's production personnel are women and this appears generally true of operations at Collins Radio and Bendix, as we've noted on previous visits.

There is still a crying need for a common usable standard of accounting in the field of airline maintenance. There is no greater incentive than well-founded comparison to bring about improvements in any operation. Yet it is still impossible to compare airline maintenance costs on a basis that mean anything to anyone.

We've about given up counting the number of airlines that have started painting the tops of their airplanes white. Seems to use the current trend started almost two years ago when LAMSA, United's Mexican affiliate, painted the top of its DC-3's. Anyway, latest in the parade is Northwest Airlines. They've come through with some figures. The white "Chapeau" adds about 15 pounds to the Martin 2-0-2, 20 pounds to the DC-4 and 35 pounds to the Boeing Stratocruiser. NWA figures it will take 375 quarts of enamel and 52 quarts of primer to finish the 23 Martins, nine Douglas DC-4's and 10 Stratocruisers. Paint cost will be about \$490.

NEW PRODUCTS

Omni-Test Equipment

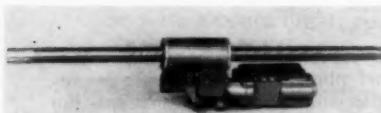
National Aeronautical Corp., Wings Field, Ambler, Pa., has introduced the Model T-3 test set for testing omnirange navigational equipment. The unit is in effect an omni-range simulator which transmits calibrated signals along any bearing as determined by control



setting. Thus omni-range receiver equipment of any make or manufacturer can be accurately tested without removing it from the airplane. The NARCO T-3 omni-range test equipment can also be used for testing and adjustment following bench overhaul. By selection of suitable controls on the test equipment, the unit can also produce signals required to test adjustment of phase localizer approach equipment and for tone localizer and VAR equipment.

Canopy Actuator

Hoover Electric Co., 2100 Stoner Ave., Los Angeles 25, Calif., has designed a new long-stroke, fast-operating cockpit canopy control unit. The Hoover control unit uses a torque limiting clutch, controlled by a direct pressure measur-



ing device, to insure positive cockpit sealing. The clutch uses no frictional parts, the load being transmitted by spring-loaded rollers. Normal load of the unit is 150 inch-pounds at 6 inches per second for a 24-inch stroke. Maximum thrust is limited by the torque limit clutch to a range of from 500-600 pounds. Weight 17 pounds. Powered by a 250-watt explosion-proof motor with thermal overload protection, magnetic clutch and brake; 17.2 to 1 gear reduction, radio noise filter, junction box and connector plug, roller bearing torque limit clutch and 8-thread, 4-lead jack screw power takeoff.

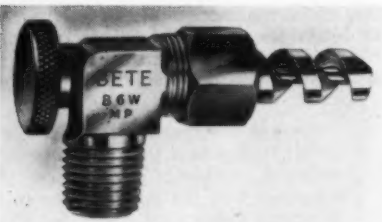
Fire Extinguisher

Pyrene Manufacturing Co., 560 Belmont Ave., Newark 8, N. J., has developed a cartridge-operated water type fire extinguisher with stainless steel shell. The manufacturer claims the unit has numerous advantages over the riveted-copper soda-acid type extinguisher generally used in parallel applications. It eliminates the need for recharging the soda-acid extinguishers annually since the carbon dioxide pressure cartridge does not require replacement until used. Gradual release of the gas insures a steady 40-foot stream of

water. The unit is tested to 500 pounds pressure rather than 350 yet is five pounds lighter than earlier extinguishers. A transparent nozzle is used.

Bete Fog Nozzle

Bete Fog Nozzle Co., Greenfield, Mass., is marketing two new wide-angle spiral fog nozzles. One of these has a capacity of one-half to two gallons per minute and the other 1½ to four gpm. The manufacturer claims a fine and uniform drop size for the nozzles which produce a 180° umbrella spray pattern with wide coverage. The nozzles are designed for



easy cleaning by the use of a removable pin which can be interchanged for varying flow rates.

Speakers

University Loudspeakers, Inc., 80 S. Kensico Ave., White Plains, N. Y., has obtained Underwriters' Laboratory approval for two new explosion-proof speakers. The units are complete reflex trumpet speakers with integral 30-watt driver unit and built in multitap line-matching transformer. Model 7101 is UL approved for Class I, Group C and D which includes locations in which flammable, volatile liquids, highly flammable gases, mixtures or other flammable substances are manufactured, used, handled or stored. Model 7102 is approved for both Class I as well as Class II, Group E, F, and G.

Phase Adapter

Varo Mfg. Co., Garland, Texas, has introduced a new electronic phase adapter. The Model 160 phase adapter changes single-phase, 115-volt 400-cycle current to three-phase, 115-volt at 100 VA. Output voltage on all phases is equal to input voltage plus or minus 3% over wide ranges of input voltage



and frequency, load and power factor, temperature and altitude. It has no moving parts, weighs 6½ pounds and has 168 cubic inches volume.

VHF Transmitter

Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich., has announced the Panelite, a new-type VHF trans-



mitter designed to meet the requirements of personal aircraft. The RT-10CP is a six-frequency VHF transmitter weighing 10 ounces and occupying only 1-11/16 square inches of space on the instrument panel. Overall dimensions are 2-7/32 x 1-11/16 x 7-27/32. Radiated output of the RT-10CP is more than 2 watts.

Skil-Drill

Skilaw, Inc., 5033 Elston Ave., Chicago, Ill., has introduced the Model 49 half-inch heavy duty Skil-Drill. The drill features the Lamb Wedge-Lock handle which the manufacturer claims provides easier handling and minimizes operator fatigue. The unit is 7½ inches long



and weighs 3¾ pounds. It has an aluminum housing, ball bearings on the armature and intermediate spindle, ball and needle roller bearings on the one-half-inch capacity chuck spindle. The universal motor has a no-load speed of 1,800 rpm. It is available in six other speeds ranging from 550 to 5,000 rpm.

Drum Head Cutter

Michael A. Schinker Mfg. Co., 6514 S. Western Ave., Chicago 36, Ill., has introduced a head cutter that cuts the head of any size drum in approximately one minute. The 36-pound cutter is manually operated for use on empty or filled drums of from 10 to 55-gallon capacity and 20-16 gauge stock. Cutting is accomplished by a blade which will handle about 1,000 heads before requiring resharpening. In operation the unit rests on the top of the drum and a crank is used to move the cutter around the drum. By substituting a roller wheel for the cutter the manufacturer claims the unit can be used for sealing leaky chimneys.



spark plug
RELIABILITY
for all types of aircraft
from the largest
to the smallest

Familiar to aviation personnel the world over are the many advantages of **BG** shielded platinum-electrode Spark Plugs.

BG NOW PRESENTS an unshielded spark plug for use on light planes. This **BG** model 706R is an unshielded, ceramic insulated spark plug featuring a resistor that reduces gap erosion and permits the plug to operate for long periods of time. The insulating material is identical to that used in **BG** platinum-electrode Spark Plugs. Of course, it is made to the same high standards of workmanship and design that characterize all **BG** products. For those who prefer a plug without resistor, the **BG** model 706 is available.

Whatever your spark plug requirements, look to **BG** for the utmost reliability.



FOR AIRCRAFT ENGINES . . . AIRCRAFT SPARK PLUGS

THE BG CORPORATION

New York 19, N. Y.

SERVING WORLD AVIATION FOR OVER 33 YEARS

Eastern Makes Major Air Coach Expansion

By WILLIAM V. HENZEY

THIS YEAR'S most significant development in the air coach field took place last month, and because of it the prospects of all domestic trunk-lines starting coach services in 1950 have become exceedingly real.

Responsible for the development were Eastern Air Lines—now the country's biggest coach operator—and the Civil Aeronautics Board. Eastern asked the Board to permit a major expansion of its coach operations which, prior to May 15, were confined to two daily flights between New York and Miami, one between Chicago and Miami, and one between New York/Washington and New Orleans.

To approve it, CAB would either have to close one eye or decide it was time to depart from its requirement that coach flights be operated only between selected pairs of high-density points—a requirement, incidentally, which when coupled with the Board's specification that high-capacity aircraft be used, has kept several carriers out of the coach business, or given them a good excuse for keeping out.

Another thing CAB had to consider was that the expanded operations proposed by Eastern were between points between which other lines were still operating DC-3 aircraft at first-class fares. EAL's coach flights would be with DC-4 planes equipped to transport 56 or more passengers.

Three Lines Protest

Three carriers, Chicago and Southern, Braniff, and Capital had filed formal protests with the Board, requesting suspension of EAL's tariff. But the Board permitted EAL's coach expansion, and on May 15, practically all major points on the line's system were receiving 4c per mile service. A flight was added between New York and Houston with stops at Washington, Atlanta, and New Orleans. Another was added between Detroit and Miami, with stops at Cleveland, Charlotte, Atlanta, and Tampa. Through connections at Atlanta, the cities of Chicago, Detroit, and Cleveland, were linked with New Orleans and Houston.

Though this expansion is not confined to points with the highest traffic density, it nevertheless does not mean that EAL is operating coach service in barren territory.

Primarily responsible for the additional flights were the successes achieved with the flights operated prior to May 15. Between New York and Miami, for example, southbound load factors on coach flights for the winter season were 86% in December, 85% in January, 91% in February, and 80% in March. Northbound, they ranged from 64% in December to 98% in March.

390 Extra Sections

These figures become more impressive when it is considered that 390 extra sections were operated in that same four-month period which comprised a total of 121 days.

Of course, that was the peak season for Miami-New York traffic, but loads on EAL's New York-New Orleans flights were equally as impressive for the same period, since the winter months comprise the off-season on that segment. Loads on these flights averaged over 70% during that period and for the first 13 days of April averaged 86% northbound and 73% southbound.

It must also be remembered that Eastern not only faced non-scheduled airline competition on its three coach routes, but scheduled air competition as well. National was competing for New York-Miami coach traffic, Delta for Chicago-Miami traffic, and Capital for New York-New Orleans business.

It becomes, therefore, a logical as-

sumption that Eastern's expansion is the natural outgrowth of a successful experiment and that further expansion not only by Eastern, but by others, may be expected soon.

The real difference in the new method of expansion as compared to the previous method is that it calls for increased service on existing coach routes, the addition of new intermediate points, and operations on new segments not necessarily of the high-density variety.

Followed through, the impact of such increased operations will be felt partly by non-coach airlines and partly by surface carriers. To preserve their traffic, and perhaps generate additional passengers, several of these non-coach lines may, at an early date, transform night flights, now operated primarily for mail and cargo traffic, to coach flights at the 4c fare.

The benefits of coach-supported night flights were expounded by Eastern in a statement to the Board in which it said it is now evident that a late night DC-4 departure out of Houston, for example, is necessary to handle the heavy end-of-the-day mail and cargo loads to the Northeast.

Losing Night Loads

The line said it was losing considerable mail and cargo traffic out of Houston because of not having



Weighing the Advantages—American Airlines uses scales and models of a DC-6 and a railroad coach in a novel window display in Hotel Statler, Washington, D. C., to portray the advantages of using air as against rail transportation.

such a late night departure. Such a service out of Houston, EAL added, would not attract sufficient passenger traffic at normal fares to support it.

But the inference is clear that a late night flight with attractive 4c per mile fares is considered a good investment for passengers, cargo shippers, the Post Office Department, and the carrier.

Among the lines not operating coach flights but who may be expected to feel the effect of EAL's operations either directly or indirectly the Chicago and Southern, Braniff, Mid-Continent and Continental. Also, increased coach services by Delta, National, and Capital are now a possibility. Actually, the Board blocked a sizable expansion proposed recently by National, presumably because of interference with the U. S.-Caribbean fare structure.

But the spark needed to raise scheduled coach services out of the piecemeal experimental stage appears to be the Eastern proposal and CAB's willingness to go along with it. If it proves successful, the margin of profits over losses throughout the trunkline industry may be the additional 4c passengers who would be drawn to night-time air flights from surface means of transportation.

Transcontinental Coach

Despite this very definite trend, however, sight must not be lost of the major league coach experiment being conducted by American and TWA between New York and Los Angeles where DC-6 and Constellation aircraft are being utilized. On this experiment still hinges the possibility of a general reduction in fares to the 4c level.

American, for the first 10 days of operation with its DC-6's, carried a total of 1,630 New York-Chicago-Los Angeles passengers with only one round-trip flight daily. 86.4% of all seats were sold, AA said. Previously, the service was provided with DC-4's.

If this success should be maintained, let alone improved, an increase in service is likely, and the eventual scaling of all fares at the 4c level a distinct possibility.

Trans-Atlantic Exemptions

The Civil Aeronautics Board has issued special exemptions to The Flying Tiger Line, Seaboard & Western Airlines, and Transocean Air Lines to conduct approximately 80 trans-Atlantic charter flights this summer.

Forty flights will be performed for Youth Argosy, Inc.; the remainder for groups with which Seaboard & Western and Transocean have made contractual arrangements.

Over the Counter

Sales Promotion

American Airlines in Washington has issued its newest consolidated airline schedule covering service by all airlines between Washington and New York via intermediate points. Schedule lists airline, equipment, departure and arrival times. It shows 58 trips daily between Washington and LaGuardia, Newark or New York International (24 AA, all to LaGuardia; 17 EAL LaGuardia and 12 Newark, and three National Newark and two New York International). If you consider only LaGuardia, there are 41 trips daily. AA also lists 17 to Boston, EAL 12. AA prints its trips in red, other airlines in black. **Herb Ford**, AA's Washington sales manager, says the consolidated schedule, issued periodically, has always been a handy sales tool . . . Thanks to **Brooke Payne**, AA's St. Louis sales manager, for sending us the direct mail piece he uses showing AA service out of that city. Has a catchy heading: "Do it the American Way—become a fellow traveler on American Airlines."

TWA is making available to interested groups a new 12-minute motion picture, "Flight to New York." It can be obtained through local TWA offices or from Institute of Visual Training, 40 E 49th St., New York. Company is also preparing Spanish, French and Italian sound-tracks and will show the movie overseas . . . TWA is now selecting the "salesman of the month." Prize is a 100 savings bond.

A "flying seminar" looks like an excellent revenue source for **Frontier Airlines** (new name for Monarch-Challenger-Arizona) this summer. It's a course at the University of Denver in "human and natural resources in the Rocky Mountain Empire." Students who enroll spend a week in school collecting maps, charts, studying terrain, weather and folklore. Then for 18 days they fly on Frontier, visiting such places as Laramie, Rawlins, Casper, Riverton, Billings, Yellowstone, Grand Canyon, Durango, Pueblo and Colorado Springs. Final week is spent in evaluation. Course is from July 24 to Aug. 23, 7½ hours social science credit, and costs \$415 including tuition, transportation and living expenses. Credit for working it out goes to **Jerry Kitchen**, Frontier's general traffic and sales manager. Sounds like a natural.

Air Coach

Scheduled air coach flights are to be used almost entirely in a new low-cost domestic two-week tour by air, arranged by **American Express Co.**, **American Airlines**, **Western Air Lines** and **Northwest Airlines**. The tour (14 will be operated between June 12 and Sept. 18) will be from Chicago to Los Angeles, San Francisco, Portland, Seattle, Victoria and back to Chicago, costing \$367.50 including transportation, hotels and sightseeing. Westbound flight will be on AA's coach, Burbank-San Francisco on WAL's coach, San Francisco-Portland-Seattle on WAL's regular flight, and Seattle-Chicago on NWA's coach.

United Air Lines started its first air coach service May 14 between Los Angeles and San Francisco/Oakland with \$9.95 fare plus tax. Using two 66-passenger DC-4's, UAL is operating four round-trips daily except Sunday, when three are flown . . . **TWA** was to place converted Constellations in New York-Chicago-Los Angeles coach service on May 26.

Traffic, Tariffs and Tours

United Air Lines is starting an advertising campaign in the west stressing advantages of a "fly to the factory" plan for prospective car buyers . . . United during the next several months will make available at all points on the system "flight kennels," so that dogs and other small pets can be shipped on passenger planes—"pet and owner can fly together." A \$5 rental fee will be charged, regardless of distance flown, and excess baggage rates will apply when the pet is flown on the same plane with the owner. Kennels were originated by UAL's medical director, **Col. A. D. Tuttle** . . .

Bob Smith, **Western Air Lines'** Seattle district sales manager, has an unusual direct mail piece. "Interested in money?" it asks. "A dollar will buy just so much, so buy the best value in air travel—buy Western." Attached is a Chinese \$100 bill . . . **Continental Air Lines** plans to distribute color photos of its Convair-Liner to barbershops along the system. Caption will say "Senil Ria Latnenitnoc," CAL spelled backwards, so that customers can read it in the mirrors. The idea has been used before, effectively . . . An **Eastern Air Lines'** folder has **Arthur Godfrey** plugging the "there's no substitute for experience" theme . . . **Air France** is making five motion pictures available for showings to clubs, schools, etc. They cover Paris, Rome, French Riviera, French Shrines, and "a day in the life of an Air France hostess".

Central Airlines is out with a new-style timetable, called a "mappable." Arrival and departure times of all Central flights are shown next to cities on a route map of the airline's system. It's somewhat similar to **Western's** flow-chart timetable. Idea was originated by **Jack Lenox**, of Central's traffic department.

—ERIC BRAMLEY



First Ladies of the skies

TWO DECADES AGO—on May 15, 1930—a great airline tradition was born. United Air Lines employed Miss Ellen Church, as the first stewardess on any airline. Soon afterwards, she and seven other stewardesses began serving the public on United Air Lines' coast-to-coast Mainliner flights.

Since then, stewardesses have been employed by nearly all of the scheduled airlines of this country and other countries throughout the world. More than 5,000 of them are now flying the airways. By their gracious

hospitality and their friendly attentiveness to the needs and desires of their passengers, these "First Ladies of the skies" have won an important place in the hearts of the traveling public.

Wherever you fly today, you'll find a pleasant, attractive stewardess who is more than willing to help you enjoy your trip to the utmost. On this, their twentieth "birthday," United extends congratulations to all stewardesses... sincere thanks, too, for their contribution to the airline industry.

UNITED AIR LINES *The Nation's First Coast-to-Coast Airline*

Traffic Man Speaks Up for the Passengers

... a plea for built-in saleability

A plea to aircraft manufacturers to build more saleability into their transports was made by Robert L. Turner, new Vice President-Sales of Northeast Airlines, at the recent aeronautic meeting of the Society of Automotive Engineers in New York.

Jokingly, Turner said "some of us in the sales end of the airline business have often felt that transport airplanes were designed by, first, making the pilot comfortable; secondly, making it easy to maintain; thirdly, providing enough gas capacity for the range desired, and last, taking whatever is left over and saying this is where and how we will move the traffic."

He presented the following items "which our customers indicate they would like to have" in an airplane:

1. "They want to be able to see out . . . Immediately after takeoff and while approaching for a landing, the customers want to see the country . . . Customers like to see . . . cloud effects . . . Some improvement can be made . . . even without enlarging the windows by relating the position of the windows to the position of the seats."

2. "Do we have to lift all of the traffic a story and a half, roughly, to get it in the airplane? That one item costs the airlines a tremendous amount every year. In addition, practically all people . . . are inherently lazy and would rather not walk up a long flight of steps just to get in the airplane." He suggested a reconsideration of high-wing airplanes.

Pet Provision

3. "In some of the more modern transports, no provision is made for carrying small animals" and in some instances the airlines are losing passengers—people won't fly because they can't take their pets with them.

4. "We need to provide a quieter ride for passengers . . . Only a small part of the present-day problem is engine and propeller noise . . . The noise from the ventilating system is a source of annoyance . . . Noises in the hydraulic or electric systems when gears or flaps are raised or lowered . . . Also, the loud bang which sometimes occurs when the gear is dropped."

5. "Aircraft for relatively short range or local operation should approximate as closely as possible the long-range aircraft's ability to get to smooth air as soon as possible. A

calm trip is just as potent a selling point for air transportation as speed."

6. "I can mention one (item) that we don't want. As far as I can see, on any domestic airline, there is no need for contemplating elaborate sleeper equipment. Present-day speeds are already beyond the point where such a facility is either necessary or desirable."

7. Because of higher speeds, "some provision must be made to serve a palatable meal rapidly."

8. "It might be possible to arrange seating accommodations so they could be reversed very easily, enabling, say, four passengers to sit in pairs facing each other . . . If possible, the seats should be arranged so that by putting two or more together we can provide facilities for stretcher cases."

9. "The most important point is the absolute necessity that something be done to speed up the handling of customers' baggage . . . Even in recent years, new airplanes have come

out with completely inadequate cargo space. The result has been that we have tried to cram baggage into space much too small and we have paid off thousands of dollars in damaged baggage claims . . . Also, we need to provide more facilities for carrying baggage in the cabin . . . Why do we put overhead racks in an airplane and then turn around and tell the customers they can't use them for anything heavier than a hat or overcoat?"

The Ultimate

10. "The final item I want to suggest . . . is something which I am sure we will not have by 1955 . . . My sanity has been questioned for even mentioning it. But somewhere in the future . . . we must have airplanes that will give all the advantages of speed, comfort, convenience and safe, dependable service, and on top of all that, land in the middle of the metropolitan areas."



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Civil Aeronautics Board Briefs

Route Actions

Mid-West Airlines, currently authorized to operate between Omaha and North Platte, Nebr., via numerous intermediate points, has applied to CAB for a westbound extension of its feeder-line certificate beyond North Platte to Cheyenne, Wyoming.

Bonanza Air Lines has petitioned the Board to attach a condition to the **Arizona Airways** certificate, which is being taken over by **Monarch Air Lines**, prohibiting operations between Phoenix and Prescott. Bonanza currently operates between the two points and told CAB that traffic will not support parallel air services.

Applications of seven U. S. companies for certificates to operate between Florida and the Bahama Islands have been consolidated into one proceeding by the CAB. The enlarged case will be known as the **Florida-Bahamas Service Case** and will encompass applications of **Mackey Air Transport**, **Island Air Ferries**, **Imperial Airways**, **Midet Aviation Co.**, **Resort Airlines**, **National Airlines** and **Eastern Air Lines**. Midet and Imperial will be permitted to conduct scheduled operations from Miami and/or West Palm Beach to West End, Grand Bahama Island, until 15 days after a decision is rendered on their certificate applications.

The temporary exemption under which the Board has permitted **Capital Airlines** to operate all-cargo flights between New York and points west via Baltimore has been extended so as to remain in effect

until 60 days after disposition of Capital's application for a certificate amendment which, if granted, would possibly place the all-cargo operation on a permanent basis.

Applications for six new feeder routes serving 32 cities and towns have been filed with the CAB by **Central Airlines**. The proposed routes are as follows: Oklahoma City to Tulsa via Stillwater and Cushing; Oklahoma City to Tulsa via Okmulgee and Muskogee; Wichita to Lincoln-Omaha via Newton, McPherson, Salina, Junction City, Manhattan and Marysville; Oklahoma City to Childress, Tex., via Norman, Chickasha, Duncan, Lawton, Wichita Falls, Frederick and Mangum; Dallas/Fort Worth to Amarillo via Weatherford, Mineral Wells, Breckenridge, Graham, Wichita Falls, Electra, Vernon, Childress and Clarendon; and Oklahoma City to Amarillo via El Reno, Weatherford, Clinton, Elk City, Pampa and Berger.

The Board has extended indefinitely its approval of the through-flight agreement of **Pan American World Airways** and **Pan American-Grace Airways**, pending a decision in the **National Airlines Route Investigation Case**, with which the issues involved in a proposed 10-year extension of the agreement have been consolidated.

Mail Rates

The new temporary mail rate now in effect on **Pan American World Airways'** Latin American Division is designed to give the carrier \$2,775,000 additional mail pay for 1949, and an estimated an-

nual amount of \$7,225,000 for the period beginning January 1, 1950.

A new temporary mail rate for **Pan American-Grace Airways** has been put in effect by the Board. It provides annual mail pay of approximately \$2,604,000 beginning January 1, 1950, an increase of \$1,534,000 annually. Panagra will receive \$3,141,000 in back mail pay under the order.

The Board has turned down **Colonial Airlines'** request that final mail rates be established only for a past period and future rates be on a temporary basis in view of **Trans-Canada Air Lines'** new services between New York and Montreal. The Board said its temporary rate procedure is designed primarily to meet emergency financial needs of carriers as quickly as possible and "is not a device to avoid the problem of fixing final rates."

The Board dismissed a petition of **Eastern Air Lines** insofar as it requested a separate mail rate for its San Juan-Miami route from Sept. 9, 1946, to July 8, 1947, and ordered that oral argument be heard on the petition affecting the period from July 8, 1947, to April 7, 1948. The Board ruled that the rate that was in effect when the route was activated was applicable until challenged. Whether the 1947 date, when EAL filed a petition affecting its domestic routes, or the 1948 date, when the Board fixed a temporary rate for domestic and overseas operations, represents the first date of challenge is to be determined.

CAB CALENDAR

June 1—(Docket 4319) Hearing in CAB investigation of operations in air transportation of Metropolitan Air Freight Depot, Inc. Tentative. Examiner Walter W. Bryan.

June 1—(Docket 4340) Prehearing conference in Monarch-Challenger Certificate Renewal-United Suspension Case. 10 a. m., Room E-214, Temporary Building 5, Washington, D. C. Examiner Herbert K. Bryan.

June 1—(Docket 3500) Resumption of hearings in National Airlines' Route Investigation Case (testimony of Braniff witnesses only). 10 a. m., Room 5855, Commerce Building, Washington, D. C. Recessed from May 3, and resumption date postponed from May 23.

June 5—(Docket 4161) Hearing resumed in Enforcement Proceeding against Trans American Airways, Inc., Great Lakes Airlines, Inc., Golden Airways, Inc. Edward Ware Tabor and Sky Coach Airtravel, Inc. 10 a. m., Room 406, U. S. Post Office Bldg., 641 Washington St., New York City. Examiner Barron Fredricks.

June 8—(Docket 2849 et al.) Hearing in Big Four Mail Rate Case. Tentative.

June 8—(Docket 4296) Hearing in CAB investigation of operations in air transportation of American Shippers, Inc. Tentative. Examiner H. K. Bryan.

June 12—(Docket 2019 et al.) Hearing in Reopened Additional California-Nevada Service Case. Tentative. Examiner F. Merritt Ruhlen.

June 12—(Docket 2123 et al.) Oral argument before the Board in Additional Service to Puerto Rico Case. 10 a. m., Room 5042, Commerce Building, Washington. Postponed from May 22.

June 12—(Docket 4344) Hearing on application for approval of an agreement between Transocean Air Lines and Loftfield, H. F., calling for, inter alia, lease Transocean aircraft and utilization of Transocean personnel. Tentative. Examiner Walter W. Bryan. Postponed from June 5.

1949 Schedule E Reports

Schedule E reports, showing salaries and stockholdings of officers and directors plus fees paid for legal and other services during 1949 have been filed with the Civil Aeronautics Board by the following airlines:

Central Airlines, Inc.

F. Kirk Johnson, chrm.-bd. of dir., no salary, 750 shares common; Deane Gill, sec'y-treas., dir., no salary, and 750 common; Keith Kahle, pres. and dir., \$4,250 salary, 343½ common; Donald B. Ehrhart, v. p., \$3,000, and 250 common; Robert E. Harding, Jr., v. p., \$3,500, and 250 common.

Chicago and Southern Air Lines, Inc.

Carleton Putnam, chrm.-bd. and dir., \$26,000 salary, \$150 bonus and indirect, and 54,800 shares common; Sidney A. Stewart pres. and dir., \$30,000 (up \$4,583.34) salary, \$150 bonus and indirect, and 900 shares common; Junius E. Cooper, v. p.-finance and dir., \$18,000 (up \$2,750) salary, \$150 bonus and indirect, and 100 shares common; William T. Arthur, v. p.-oper., \$11,278.98 salary, and 500 shares common; Richard S. Maurer, sec'y-gen. counsel, \$12,666.67 (up \$666.67) salary, and 40 shares common; Thomas F. Hambleton, treas., \$7,000 (up \$600) salary, and 100 shares common; Robert S. Scrivener, ass't treas., \$5,160 salary, and 20 shares common; Erma Murray, ass't sec'y, \$4,589.85 (down \$90.15) salary, and 50 shares common; L. Raymond Billett, dir., no salary, \$150 bonus and indirect, and no shares; John R. Longmire, dir., no salary, \$150 bonus and indirect, and 9,534 shares common.

¹ Held in joint tenancy with wife.

Colonial Airlines, Inc.

Sigmund Janas, pres. and dir., \$24,500 (up \$6,500) salary, and 36,922 shares common; Edward S. Ridley, v. p., \$10,999.92 (up \$999.96) salary, and no shares; Alfred M. Hudson, v. p., \$10,999.92 (up \$999.96) salary, and 900 shares common; Branch T. Dykes, v. p.-oper. and dir., \$15,000 salary, and 500 shares common; Sigmund Janas, Jr., v. p.-traf., \$10,999.92 (up \$1,799.94) salary, and no shares; James F. Gormley, treas., \$11,416.59 (up \$2,249.93) salary, and no shares; Warren C. Cooper, Jr., sec'y, \$7,950 (up \$1,575) salary, and 139 shares common; Karl M. Bissell, dir., \$550 (up \$550) salary, and 2,200 shares common; Eugene P. Barry, dir., \$500 (up \$190) salary, and 100 shares common; Francis Hartley, Jr., dir., \$550 (up \$400) salary, and 13,804 shares common; James M. Landis, dir., \$400 (up \$130) salary, and no shares.

| | |
|--|--------------|
| Landis, Gewirtz & Maclay, Wash- ington, D. C., legal services, 1949 | \$22,600.00* |
| Ernest Cunco, New York, legal services, 1949 | 26,300.00 |
| Davies, Richberg, Beebe, Busick & Richardson, legal services, 1949 | 33,100.00 |
| Alvin P. Adams & Associates, New York, aviation consultants, 1949 | 10,500.00 |
| Canadian Air Express, Ltd., Mon- treal, management of Canadian offices, 1949 | 15,000.00 |

* \$600 paid to Landis individually, \$1,000 paid to Gewirtz & Maclay individually, \$21,000 paid to Landis, Gewirtz & Maclay.

Inland Air Lines, Inc.

Paul E. Sullivan, sec'y-treas. and dir., no salary, and 1 share capital; J. J. Taylor, ass't sec'y-treas. and dir., no salary, 1 share capital; R. K. Nichols, ass't sec'y, no salary, and 1 share capital; Charlie M. James (re-signed) v. p. and dir., no salary, and no shares.

TO thirty-two countries on five continents fly the silver Viking-ships of Scandinavian Airlines. The routes of the **SAS DC-6's** stretch across the globe from New York to Bangkok . . . from Buenos Aires to the Arctic Circle.



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General Offices: Atlanta, Ga.

Airline Commentary

By Eric Bramley



OUR THANKS to Capt. Frank Petee, of All American Airways, for the following story: "One night recently, I was purchasing a one-way Philadelphia to Washington ticket at American Airlines' Philly ticket counter. The agent informed me that the fare was \$8.68. I handed him a \$10 bill and 70 cents in change. The agent, more harried than usual (and it was a very late hour, anyway) started to subtract the difference on paper. I murmured, 'I think that's two-o-two.' The agent looked up coldly from his figuring and said, 'Excuse me, sir, but around American that's a dirty word'."

Someone commented very favorably recently on United Air Lines' public address announcements at Washington National Airport. The announcements are slow, distinct and easy to understand, our observer said. Upon checking, we discovered that this was not an accident. UAL, it seems, has had a crew of men touring the entire system, overhauling PA procedures. Announcements were revised, wording and timing changed, and agents re-trained. A commendable program.

We beefed some time back about buying airline trip insurance from machines at airports and then not being able to buy a stamp to mail the policy. William Churchill, of Associated Aviation Underwriters, which handles the machines, has a plan in operation that should please all airline passengers. AAU, he tells us, has made an agreement with Howard Ailor and the Hamilton Scale Co. of Toledo, to install at least one stamp machine beside each of the insurance machines. This will be done wherever arrangements can be worked out with airport managements. The unit included a one-cent personal weighing machine with a postage stamp dispenser, and can be obtained either with or without a change-making device to provide coins for the stamp machine. The airport keeps stamp profits, and weighing revenue goes to Hamilton (AAU gets nothing). Sounds like a darned good deal, beneficial to the public. Incidentally, Churchill has an interesting idea. He's trying to get the airlines to start using the term "round flight" in place of "round-trip." AAU is using it in a new folder describing trip insurance—thinks it better expresses the coverage. What's your reaction?

Glancing through the current timetable of Canadian Pacific Airlines, we happened to notice on the back cover an illustration of a woman holding up two fingers, saying, "Two reasons why I fly." We read further. Point one: "Air travel is safe travel. It is 20 times safer to travel by air than in my own automobile." Point two: "I would have to fly one million miles each year, for a period of 100 years, before I ran the risk of a fatal accident." A darned good sales talk, and a good place to print it.

In the April 1 column we reported that Capital Airlines carried a passenger out of Washington with 951 lbs. of baggage, and wondered if he hadn't had the largest excess baggage bill on record. Two people differ. From Stockholm, Sweden, comes a letter from Curt Gille, of Scandinavian Airlines System. In late 1949, he says, a Chinese named In-Ken-Ho flew from Moscow to Stockholm. He was accompanied by Sen-Tjen-Ion, Goan-I-Fan, Gen-In and Nion-In "and he brought not less than 64 pieces of luggage with him. The weight of the luggage amounted to 2,972 lbs. This must be the world record in air excess baggage." John Powell, TWA's Peoria district manager, writes: "This is digging pretty far into the past to top someone's story, but . . . in 1935 in the old consolidated ticket office at Lambert Field in St. Louis, we collected something in the neighborhood of \$1,200 excess baggage charges on the domestic portion of a St. Louis-Honolulu passenger's haul. Of course, in those days free allowance was 35 lbs. and we collected only on the excess baggage from origination point to the seaboard gateway . . . He had to pay PAA again in San Francisco. Norman Anishanslin, presently traveling auditor for C&S, or Larry Ulm, sales representative for AAL in St. Louis, can probably verify the exact amount." Any more contributions?

Airline People

ADMINISTRATIVE

Andrew B. Shea, president of Pan American-Grace Airways since last year, has been elected first vice president of W. R. Grace & Co., owner of 50% of Panagra's stock. He will continue to serve as president of the airline.

John C. Collins, vice president and secretary of Mid-Continent Airlines, and Sidney F. Brody, formerly vice president and general manager of Aeronautical Corp., have been elected directors of Mid-Continent.

R. Dixon Speas has resigned his position as special assistant to the president of American Airlines to become U. S. representative for the A. V. Roe Canada Limited, of Toronto, Ontario. He will handle U. S. certification problems for the Avro Jetliner and will spend part of his time in Toronto and part in a New York office.

C. W. Haas has been named property accounting manager for United Air Lines, succeeding C. E. Stern, who resigned recently. Harold E. Weary succeeds to Haas' former job of accounts payable manager. Other appointments include those of O. E. Stolberg as supervisor of property accounting, James T. O'Connor as chief of payroll accounting, and C. A. Walcher as supervisor of the Chicago payroll preparation unit.

R. B. Kiel was elected assistant secretary and assistant treasurer of Helicopter Air Service, Inc., and S. J. Walker was elected a director of the company.

C. L. Stewart, economist for Northwest Airlines since 1947 and a former staff member of the Brookings Institution in Washington, has been elected assistant secretary of NWA.

James Hopkins Smith, Jr., a former vice president of Pan American World Airways, has been elected to the board of directors of Slick Airways.

OPERATIONS-MAINTENANCE

John Long, who has been Braniff Airways' manager in Ecuador, was to become Argentine manager on June 1 with offices at Buenos Aires. Don C. Greffe, heretofore manager in Panama, now becomes manager for both Ecuador and Panama. Pedro A. Diaz, formerly an official of the Panamanian Ministry of Foreign Relations, is the new acting district traffic manager for Braniff in Panama, while Paul Parsons, Jr., formerly in international sales at Houston, is the new manager at Guayaquil, Ecuador.

Lenore Neward has been appointed chief hostess of the western region for Capital Airlines, with headquarters in Detroit. Joy Geddes has been given the same post for the eastern region, with headquarters in Washington.

James D. Gibson has been appointed station manager for Pan American

World Airways at San Juan, succeeding William R. McElhannon, who is on leave of absence. Gibson recently has been serving in the superintendent of stations' office at Miami and before that was station manager at Kingston, Jamaica.

TRAFFIC & SALES

Robert L. Turner, who resigned recently as general traffic manager of Eastern Air Lines, has been named vice president-sales of Northeast Airlines. He had been with Eastern for 15 years, except for three years of service with the Air Transport Command.



Turner

Alex G. Harris, formerly regional cargo sales manager, for Eastern Air Lines for seven years, has been appointed New Jersey sales manager for U. S. Airlines, all-cargo carrier.

Ivan W. Plumley, formerly Eastern Air Lines traffic and sales representative in New York, has been promoted and transferred to Detroit as regional agency representative.

R. J. Jeppesen, former traffic representative for Chicago and Southern Air Lines in Houston, has been put in charge of the company's new traffic office in Tulsa.

Gage T. Sproull, formerly with American Airlines and Southwest Airways, has been appointed traffic manager for Chicago and Southern Air Lines in northern California, with offices in San Francisco.

Ted Helin has been promoted from reservation agent to traffic representative for Chicago and Southern Air Lines in Chicago.

Robert G. Strong has been promoted to assistant to the general sales manager in sales and promotion research for Slick Airways.

Charles A. Bucks has been promoted to district traffic and sales manager for Pioneer Air Lines to cover the Lubbock-Plainview-Amarillo-Roswell territory.

Clarence Liske, formerly district traffic manager for Wisconsin Central Airlines in the Chicago-Milwaukee area, has been named central district traffic manager, succeeding Harlow Chamberlain, resigned.

Kenneth O. Smith, former manager editor of the Inglewood, Calif., **Daily News**, has been named news bureau manager for Western Air Lines, succeeding Rocky Spicer, resigned.

W. A. Shade, named line auditor in Northwest Airlines' Orient region, has assumed his duties in Tokyo. He joined NWA as an accountant at Shemya in 1948.

Eugene T. Thummel has been appointed superintendent of passenger service for Pioneer Air Lines. He formerly was a district traffic and sales manager.

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EXPORT DEPARTMENT • CABLE ADDRESS 'AIRSOC.TETERBORO'

Serving the Nation in Aviation

U. S. Domestic Airline Revenues & Expenses for February, 1950

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUNDS & INDIRECT EXPENSES | NET OPERATING INCOME |
|---------------|--------------------------|--------------------|---------------|------------------|------------------|-------------------------|------------------------------|--------------------------|-----------------------------|-----------------------------|----------------------|
| American | \$ 6,498,090 | \$ 5,405,661 | \$ 432,909 | \$ 146,031 | \$ 427,232 | \$ 76,956 | \$ 2,998 | \$ 7,113,598 | \$ 3,438,577 | \$ 3,675,021 | \$ -615,508 |
| Brantiff | 1,050,071 | 804,068 | 184,472 | 20,945 | 19,005 | 7,468 | 11,072 | 1,151,841 | 555,118 | 596,723 | -101,770 |
| Capital | 1,872,032 | 1,131,694 | 464,004 | 47,701 | 93,907 | 9,081 | 106,775 | 1,922,401 | 878,920 | 1,043,481 | -50,369 |
| Caribbean | 70,078 | 53,091 | 11,689 | ... | 2,521 | 355 | ... | 68,261 | 28,561 | 39,700 | 1,818 |
| C & S | 590,619 | 409,942 | 185,434 | 13,777 | 17,417 | 5,383 | ... | 634,118 | 256,643 | 377,475 | -43,499 |
| Colonial | 236,601 | 162,468 | 67,042 | 1,812 | 2,215 | 1,377 | ... | 347,184 | 153,854 | 193,330 | -110,583 |
| Continental | 355,828 | 232,215 | 104,048 | 2,416 | 6,569 | 2,230 | 3,976 | 440,533 | 199,142 | 241,391 | -84,705 |
| Delta | 1,490,701 | 1,265,737 | 147,391 | 21,130 | 33,978 | 22,651 | ... | 1,351,672 | 688,766 | 662,906 | 139,028 |
| Eastern | 6,627,695 | 5,918,121 | 264,390 | 99,747 | 213,057 | 116,114 | 152 | 5,608,299 | 2,929,870 | 2,678,429 | 1,019,396 |
| Hawaiian | 236,672 | 202,184 | 2,430 | 9,094 | 16,264 | 4,795 | 638 | 263,438 | 101,045 | 162,393 | -26,766 |
| Inland* | 197,941 | 136,748 | 56,499 | 1,000 | 2,168 | 1,296 | ... | 179,970 | 72,330 | 107,640 | 17,971 |
| NCA | 560,193 | 405,868 | 129,585 | 5,508 | 8,300 | 3,983 | 3,918 | 547,331 | 217,310 | 330,021 | 12,862 |
| National | 1,587,039 | 1,376,816 | 130,133 | 29,693 | 18,710 | 25,240 | 3,644 | 1,204,960 | 636,946 | 568,014 | 382,079 |
| Northeast | 325,897 | 184,847 | 95,321 | 3,877 | 5,061 | 938 | 2,418 | 428,900 | 210,986 | 217,914 | -103,003 |
| Northwest | 1,716,736 | 1,362,408 | 222,636 | 41,947 | 70,023 | 9,991 | 2,148 | 2,954,274 | 1,545,875 | 1,408,399 | -1,237,538 |
| Trans Pacific | 28,856 | 23,855 | ... | 109 | 845 | 279 | 2,831 | 57,884 | 21,049 | 36,835 | -9,028 |
| TWA | 3,772,255 | 2,973,690 | 412,538 | 170,194 | 172,680 | 32,410 | 24,550 | 4,676,919 | 2,316,659 | 2,360,260 | -294,666 |
| United | 5,238,861 | 4,151,271 | 492,508 | 182,023 | 306,423 | 41,355 | 24,188 | 6,406,312 | 2,710,129 | 3,696,183 | -1,167,451 |
| Western* | 762,055 | 462,019 | 183,047 | 10,000 | 11,045 | 3,417 | 107,668 | 769,778 | 372,409 | 397,369 | -27,723 |
| TOTALS | 33,198,220 | 26,662,565 | 3,506,096 | 766,204 | 1,423,420 | 365,319 | 296,976 | 36,127,673 | 17,314,189 | 18,813,484 | -2,929,453 |

* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.

NOTE: These figures are taken from monthly reports filed by the airlines with CAB. The data are tentative and subject to later change.

U. S. International Airline Traffic for February, 1950

| AIRLINES | REVENUE PASSENGERS | REVENUE PASSENGER MILES | AVAILABLE SEAT MILES | PASSENGER LOAD FACTOR | U. S. MAIL TON-MILES * | FOREIGN MAIL TON-MILES | EXPRESS TON-MILES | FREIGHT TON-MILES | TOTAL TON-MILES | REVENUE PASSENGER MILES | % AVAILABLE SEAT MILES USED | REVENUE PASSENGER MILES | % SCHEDULED MILES COMPLETED |
|----------------|--------------------|-------------------------|----------------------|-----------------------|------------------------|------------------------|-------------------|-------------------|-----------------|-------------------------|-----------------------------|-------------------------|-----------------------------|
| American | 7,488 | 6,163,000 | 9,468,000 | 65.09 | 10,436 | 3,612 | 673 | 96,536 | 781,979 | 1,196,128 | 65.38 | 202,689 | 184,819 |
| Amer. Overseas | 7,480 | 11,228,000 | 17,926,000 | 62.64 | 111,680 | 40,253 | 196,873 | ... | 1,594,490 | 2,628,342 | 60.67 | 361,042 | 345,792 |
| Brantiff | 1,260 | 2,594,000 | 6,713,000 | 38.64 | 1,760 | 956 | ... | 43,729 | 298,477 | 944,249 | 31.61 | 156,227 | 157,577 |
| C & S | 1,972 | 2,364,000 | 6,831,000 | 34.61 | 2,353 | 618 | ... | 60,935 | 308,530 | 819,758 | 37.64 | 165,988 | 166,527 |
| Colonial | 557 | 431,000 | 1,071,000 | 40.24 | 119 | 28 | ... | 1,932 | 48,512 | 157,118 | 30.88 | 24,450 | 25,274 |
| Eastern | 2,123 | 2,068,000 | 3,403,000 | 60.76 | 5,141 | ... | ... | 28,104 | 257,206 | 417,671 | 61.58 | 67,293 | 58,240 |
| National | 8,054 | 2,101,000 | 3,754,000 | 55.97 | 1,338 | ... | 18,630 | ... | 232,413 | 512,012 | 45.39 | 69,968 | 71,848 |
| Northwest | 2,711 | 5,257,000 | 11,140,000 | 47.19 | 150,837 | 18,432 | 5,201 | 379,115 | 1,136,340 | 1,793,497 | 63.36 | 446,308 | 443,456 |
| Panama | 7,810 | 8,195,000 | 16,216,000 | 50.52 | 27,605 | 21,268 | 124,645 | ... | 1,063,195 | 2,142,234 | 49.65 | 437,139 | 442,528 |
| Pan American | 64,888 | 44,781,000 | 74,438,000 | 60.16 | 206,495 | 46,743 | 1,784,883 | 30,719 | 6,670,363 | 11,908,441 | 56.01 | 2,186,642 | 1,933,494 |
| Latin Amer. | 7,498 | 17,001,000 | 27,539,000 | 61.73 | 212,484 | 68,593 | 584,828 | ... | 2,776,465 | 4,825,521 | 57.54 | 803,524 | 877,101 |
| Atlantic | 5,767 | 14,609,000 | 30,080,000 | 48.57 | 389,218 | 54,501 | 348,779 | 579 | 2,314,068 | 4,866,032 | 50.46 | 743,846 | 715,291 |
| Pacific | 1,933 | 2,066,000 | 4,644,000 | 43.37 | 27,089 | ... | 253,863 | ... | 498,715 | 1,054,287 | 47.30 | 164,148 | 168,308 |
| Alaska | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| TWA | 6,468 | 16,413,000 | 27,147,000 | 60.46 | 232,049 | 117,039 | ... | 409,219 | 2,571,125 | 3,973,641 | 64.70 | 816,044 | 845,242 |
| United | 1,688 | 4,051,000 | 7,112,000 | 56.96 | 42,583 | ... | ... | 18,734 | 485,414 | 841,439 | 57.69 | 134,423 | 134,423 |
| TOTALS | 127,697 | 139,722,000 | 247,602,000 | 56.26 | 1,421,187 | 771,553 | 3,318,335 | 1,069,602 | 21,037,390 | 37,800,370 | 55.65 | 6,779,731 | 6,529,920 |

* Includes air parcel post.

NOTE: Data in above tabulations were compiled by American Aviation Publications from monthly reports filed by the airlines with CAB. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Brantiff in South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

U. S. Feeder Airline Revenues & Expenses for 1949

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUNDS & INDIRECT EXPENSES | NET OPERATING INCOME |
|---------------------------------|--------------------------|--------------------|---------------|------------------|------------------|-------------------------|------------------------------|--------------------------|-----------------------------|-----------------------------|----------------------|
| All American ⁽¹⁾ | \$ 1,987,400 | \$ 696,833 | \$ 1,347,428 | \$ 21,574 | \$... | \$ 2,449 | \$ 1,158 | \$ 2,425,538 | \$ 1,163,180 | \$ 1,262,358 | \$ -438,048 |
| Bonanza ⁽²⁾ | 26,443 | 7,562 | 18,407 | 15 | 30 | 20 | 408 | 29,359 | 14,135 | 15,225 | -2,916 |
| Central ⁽³⁾ | 143,922 | 6,991 | 136,422 | ... | ... | ... | 87 | 154,753 | 59,713 | 95,040 | -10,829 |
| Challenger | 1,455,336 | 436,293 | 983,585 | 10,443 | 17,004 | 2,938 | 2,819 | 1,468,522 | 792,640 | 675,882 | -13,186 |
| Empire | 988,148 | 312,467 | 655,370 | 4,222 | ... | 1,760 | 9,238 | 900,799 | 485,544 | 415,256 | 87,140 |
| Mid-West ⁽⁴⁾ | 68,066 | 3,729 | 64,115 | ... | ... | 10 | 213 | 92,765 | 49,747 | 43,018 | -24,699 |
| Monarch | 1,582,320 | 481,792 | 1,121,600 | 7,599 | 22,368 | 2,121 | 10,614 | 1,563,090 | 827,212 | 735,878 | 19,211 |
| Piedmont | 2,437,419 | 1,118,530 | 1,282,446 | 13,476 | 18,652 | 9,690 | 5,298 | 2,409,040 | 1,442,946 | 966,094 | 28,379 |
| Pioneer | 3,366,874 | 1,492,224 | 1,718,920 | 10,667 | 25,681 | 10,325 | 36,276 | 3,031,136 | 1,556,410 | 1,474,725 | 315,719 |
| Robinson | 907,594 | 448,618 | 445,894 | ... | 7,623 | 1,132 | 4,883 | 1,136,049 | 585,801 | 550,248 | -228,455 |
| Southern ⁽⁵⁾ | 582,361 | 101,077 | 475,010 | 5,785 | ... | 432 | ... | 806,037 | 450,439 | 355,597 | -223,675 |
| Southwest | 2,398,581 | 1,059,558 | 1,249,992 | 14,136 | 36,007 | 3,796 | 15,607 | 2,263,878 | 1,159,332 | 1,104,546 | 134,702 |
| Trans-Texas | 2,286,230 | 537,579 | 1,723,293 | 7,940 | 11,013 | 3,238 | 1,942 | 2,249,680 | 1,230,971 | 1,018,708 | 36,550 |
| Turner ⁽⁶⁾ | 28,270 | 5,776 | 21,151 | 134 | ... | 19 | 1,190 | 43,129 | 18,409 | 24,720 | -14,879 |
| West Coast | 1,253,864 | 515,927 | 721,183 | 5,928 | ... | 1,208 | 5,726 | 1,264,436 | 602,304 | 662,131 | -10,572 |
| Virginia ⁽⁷⁾ | 28,109 | 2,411 | 25,093 | ... | ... | 1 | 504 | 44,547 | 20,916 | 23,631 | -16,438 |
| Wis. Central | 1,385,734 | 271,576 | 1,096,881 | 8,364 | ... | 1,519 | ... | 1,339,514 | 694,837 | 644,677 | 46,220 |
| TOTALS | 20,906,761 | 7,338,943 | 13,046,810 | 110,283 | 138,376 | 40,658 | 96,063 | 21,222,270 | 11,154,536 | 10,067,732 | -315,507 |
| Hel. Air Service ⁽⁸⁾ | 98,447 | ... | 98,369 | ... | ... | ... | ... | 96,069 | 50,609 | 45,460 | 2,378 |
| Los Angeles | 423,817 | ... | 423,739 | ... | ... | ... | ... | 414,273 | 263,081 | 151,192 | 9,545 |

1) Began passenger service March 7, 1949.
2) Began operations December 19, 1949.
3) Began operations September 15, 1949.
4) Began operations October 21, 1949.
5) Began operations June 10, 1949.
6) Began operations November 12, 1949.
7) Began operations September 19, 1949.
8) Began operations August 20, 1949.

U. S. Feeder Airline Balance Sheet Data as of Dec. 31, 1949

| AIRLINES | TOTAL ASSETS | CURRENT ASSETS | INVESTMENTS & SPECIAL FUNDS | OPERATING PROP. & EQUIPMENT | DEFERRED CHARGES | CURRENT LIABILITIES | LONG-TERM DEBT | DEFERRED CREDITS | OPERATING RESERVES | CAPITAL STOCK | SURPLUS |
|------------------|--------------|----------------|-----------------------------|-----------------------------|------------------|---------------------|----------------|------------------|--------------------|---------------|--------------|
| All American | \$ 2,888,386 | \$ 659,082 | \$ 207,543 | \$ 1,593,432 | \$ 291,763 | \$ 952,168 | \$ 368,450 | \$ 4,778 | \$ 27,707 | \$ 513,660 | \$ 1,021,623 |
| Bonanza | 350,046 | 42,706 | ... | 196,056 | 109,796 | 129,419 | ... | 30,612 | ... | 409,678 | -219,662 |
| Central | 379,362 | 177,900 | ... | 175,700 | 65,742 | 53,447 | 282,945 | 32 | ... | 25,000 | -21,681 |
| Challenger | 490,093 | 251,309 | 360 | 157,927 | 37,862 | 194,556 | 1,697 | 4,882 | ... | 294,646 | -5,688 |
| Empire | 631,566 | 183,426 | 214,536 | 190,752 | 31,986 | 82,525 | ... | 3,988 | ... | 561,489 | -18,477 |
| Mid-West | 222,119 | 47,239 | ... | 80,220 | 94,060 | 92,955 | 55,016 | 46,058 | ... | 7,750 | 29,340 |
| Monarch | 697,196 | 400,904 | 9,146 | 270,688 | 56,458 | 184,162 | ... | 7,680 | ... | 468,540 | 76,815 |
| Piedmont | 1,559,552 | 501,349 | 148,737 | 513,007 | 88,512 | 415,752 | ... | 4,096 | 69,954 | 984,000 | -114,251 |
| Pioneer | 1,273,405 | 816,116 | 511 | 351,799 | 105,019 | 326,090 | ... | 8,393 | ... | 90,227 | 840,694 |
| Robinson | 1,035,864 | 156,485 | 220 | 594,680 | 284,479 | 676,061 | 584,925 | 1,123 | ... | 175,027 | -402,974 |
| Southern | 803,014 | 209,561 | 511 | 318,659 | 158,963 | 426,279 | 155,729 | 997 | ... | 492,700 | -272,690 |
| Southwest | 1,253,711 | 886,603 | 4,813 | 281,341 | 80,954 | 261,014 | ... | 8,768 | 53,427 | 323,830 | 608,672 |
| Trans-Texas | 821,532 | 360,635 | 31,683 | 253,911 | 64,809 | 248,657 | ... | 1,431 | ... | 900,000 | -328,556 |
| Turner | 260,741 | 27,280 | 220 | 145,491 | 87,749 | 119,626 | ... | ... | 2,509 | 156,085 | -17,479 |
| West Coast | 1,016,495 | 615,335 | ... | 310,605 | 90,554 | 140,640 | 130,000 | 4,533 | 12,638 | 187,371 | 541,313 |
| Wiggins | 270,166 | 45,985 | 66,419 | 29,629 | 128,134 | 13,803 | ... | ... | 2,644 | 77,868 | 175,851 |
| Via. Central | 900,060 | 275,296 | 10 | 324,401 | 234,975 | 269,270 | ... | 3,555 | ... | 155,000 | 421,936 |
| TOTALS | 14,613,290 | 5,697,411 | 684,731 | 5,708,838 | 2,007,815 | 4,587,226 | 1,576,362 | 131,226 | 168,879 | 5,824,871 | 2,321,825 |
| Hel. Air Service | 449,183 | 122,141 | 10 | 176,296 | 82,156 | 37,983 | ... | ... | ... | 401,100 | 101 |
| Los Angeles | 294,179 | 51,827 | 10 | 174,501 | 56,453 | 30,723 | ... | 210 | ... | 294,000 | -40,753 |

U. S. Feeder Airline Revenues & Expenses for Oct.-Dec., 1949

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUND & INDIRECT EXPENSES | NET OPERATING INCOME |
|----------------------|--------------------------|--------------------|---------------|------------------|------------------|-------------------------|------------------------------|--------------------------|-----------------------------|----------------------------|----------------------|
| All American (1) | \$ 856,008 | \$ 181,424 | \$ 660,369 | \$ 10,446 | \$... | \$ 666 | \$ 456 | \$ 764,368 | \$ 354,625 | \$ 409,743 | \$ 91,639 |
| Bonanza (2) | 26,443 | 7,562 | 18,407 | 15 | 30 | 20 | 408 | 29,359 | 14,135 | 15,225 | -2,916 |
| Central (3) | 135,911 | 6,403 | 128,798 | ... | ... | ... | 87 | 127,505 | 51,689 | 8,406 | 8,406 |
| Challenger | 274,127 | 79,434 | 185,076 | 3,776 | 8,091 | 614 | 1,084 | 345,613 | 170,608 | 167,005 | -71,486 |
| Empire | 240,612 | 76,453 | 155,957 | 1,311 | ... | 411 | 5,572 | 229,584 | 123,072 | 106,513 | 11,028 |
| Mid-West (4) | 68,066 | 3,729 | 64,115 | ... | ... | 10 | 213 | 92,765 | 49,747 | 43,018 | -24,699 |
| Monarch | 391,142 | 95,239 | 281,908 | 1,594 | 6,050 | 234 | 4,834 | 385,573 | 209,503 | 176,070 | 5,569 |
| Piedmont | 720,415 | 306,427 | 386,466 | 4,607 | 6,250 | 2,770 | 1,072 | 652,555 | 399,897 | 262,658 | 67,860 |
| Pioneer | 853,330 | 385,599 | 418,931 | 3,506 | 11,039 | 2,484 | 21,608 | 751,321 | 386,130 | 365,190 | 102,010 |
| Robinson | 219,523 | 123,770 | 91,731 | ... | 2,084 | 261 | 1,774 | 291,968 | 144,761 | 147,208 | -72,445 |
| Southern (5) | 322,637 | 56,480 | 262,668 | 1,188 | ... | 258 | ... | 440,984 | 253,073 | 187,111 | -118,347 |
| Southwest | 581,764 | 236,386 | 314,834 | 3,912 | 8,965 | 919 | 4,940 | 562,793 | 284,021 | 278,772 | 18,971 |
| Trans-Texas | 609,702 | 158,543 | 440,906 | 2,804 | 5,162 | 977 | 1,061 | 481,043 | 275,980 | 205,063 | 128,659 |
| Turner (6) | 28,270 | 5,776 | 21,151 | 134 | ... | 19 | 1,190 | 43,129 | 18,409 | 24,720 | -14,859 |
| West Coast | 265,825 | 87,533 | 173,830 | 1,140 | ... | 205 | 1,001 | 305,062 | 144,210 | 160,852 | -19,737 |
| Wiggins (7) | 25,844 | 2,170 | 23,068 | ... | ... | 1 | 604 | 40,555 | 19,319 | 21,237 | -14,712 |
| Via. Central | 441,436 | 68,024 | 369,846 | 2,448 | ... | 308 | ... | 410,624 | 210,831 | 199,792 | 30,814 |
| TOTALS | 6,061,057 | 1,881,162 | 3,998,061 | 38,481 | 43,671 | 10,157 | 46,104 | 5,954,801 | 3,108,445 | 2,845,857 | 106,255 |
| Hel. Air Service (8) | 82,034 | ... | 82,034 | ... | ... | ... | ... | 81,966 | 44,705 | 37,282 | 48 |
| Los Angeles | 102,334 | ... | 102,329 | ... | ... | ... | ... | 122,396 | 81,023 | 41,373 | -21,062 |

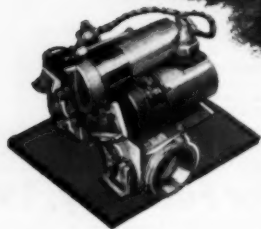
1) Began passenger service March 7, 1949.
2) Began operations December 19, 1949.
3) Began operations September 15, 1949.
4) Began operations October 21, 1949.
5) Began operations June 10, 1949.
6) Began operations November 12, 1949.
7) Began operations September 19, 1949.
8) Began operations August 10, 1949.

NOTE: Under CAB filing procedures, the airlines file a cumulative quarterly financial report for October-December in place of a separate statement for the month of December. Traffic data, however, are reported separately for each month.

U. S. Feeder Airline Revenues & Expenses for February, 1950

| AIRLINES | TOTAL OPERATING REVENUES | PASSENGER REVENUES | MAIL REVENUES | EXPRESS REVENUES | FREIGHT REVENUES | EXCESS BAGGAGE REVENUES | NON-SCHEDULED TRANSPORT REV. | TOTAL OPERATING EXPENSES | AIRCRAFT OPERATING EXPENSES | GROUND & INDIRECT EXPENSES | NET OPERATING INCOME |
|------------------|--------------------------|--------------------|---------------|------------------|------------------|-------------------------|------------------------------|--------------------------|-----------------------------|----------------------------|----------------------|
| All American | \$ 144,450 | \$ 45,005 | \$ 96,725 | \$ 1,773 | \$... | \$ 185 | \$... | \$ 236,086 | \$ 110,830 | \$ 125,256 | \$ -91,636 |
| Bonanza | 59,742 | 17,567 | 41,638 | 21 | 360 | 157 | ... | 40,701 | 30,233 | 30,468 | -999 |
| Central | 51,464 | 2,893 | 48,343 | ... | ... | 34 | 110 | 46,092 | 19,988 | 26,104 | 5,371 |
| Challenger | 76,205 | 22,170 | 51,852 | 434 | 788 | 136 | 752 | 94,303 | 45,513 | 48,790 | -18,098 |
| Empire | 70,832 | 22,724 | 47,241 | 570 | ... | 140 | ... | 72,364 | 37,297 | 35,067 | -1,532 |
| Mid-West | 46,668 | 3,126 | 43,511 | ... | ... | 25 | ... | 45,521 | 23,880 | 21,641 | -1,147 |
| Monarch | 118,889 | 25,553 | 87,400 | 498 | 1,824 | 119 | 2,980 | 133,268 | 71,061 | 62,207 | -14,379 |
| Piedmont | 178,052 | 71,297 | 101,481 | 1,400 | 1,876 | 674 | 1,212 | 215,403 | 124,249 | 91,154 | -37,351 |
| Pioneer | 252,619 | 111,318 | 128,746 | 1,714 | 2,338 | 886 | 4,079 | 240,620 | 119,244 | 121,376 | 11,999 |
| Robinson | 54,261 | 26,309 | 24,949 | 372 | 563 | 98 | ... | 97,905 | 47,821 | 50,084 | -43,644 |
| Southern | 98,900 | 17,624 | 80,145 | 575 | ... | 121 | ... | 125,054 | 63,952 | 61,102 | -26,153 |
| Southwest | 142,998 | 58,741 | 78,745 | 1,039 | 3,208 | 467 | ... | 148,790 | 65,554 | 83,236 | -5,792 |
| Trans-Texas | 168,076 | 32,632 | 133,368 | 757 | 1,126 | 146 | ... | 176,329 | 91,528 | 84,801 | -8,253 |
| Turner | 41,908 | 3,741 | 24,655 | 118 | ... | 34 | 13,359 | 43,057 | 22,634 | 20,423 | -1,149 |
| West Coast | 85,180 | 27,506 | 56,814 | 325 | ... | 54 | ... | 96,475 | 45,455 | 51,020 | -11,295 |
| Wiggins | 13,091 | 840 | 13,051 | ... | ... | ... | ... | 16,695 | 8,382 | 8,313 | -2,804 |
| Via. Central | 117,380 | 24,989 | 91,376 | 890 | ... | 116 | ... | 130,620 | 68,119 | 62,981 | -13,240 |
| TOTALS | 1,721,515 | 516,115 | 1,150,120 | 10,446 | 12,083 | 3,342 | 22,492 | 1,979,283 | 995,740 | 983,543 | -257,768 |
| Hel. Air Service | 27,559 | ... | 29,551 | ... | ... | ... | ... | 27,854 | 15,805 | 12,049 | 1,705 |
| Los Angeles | 28,451 | ... | 28,451 | ... | ... | ... | ... | 33,498 | 21,193 | 12,305 | -5,047 |

NOTE: Figures are taken from monthly reports filed by the airlines with CAB. The data are tentative and subject to later change.



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Low-Cost Taxiway 'Lighting' System

By KEITH SAUNDERS

THE FACT that 60% of the nation's major airports have unlighted taxiways is not due to indifference or miserliness on the part of the airport operators; the average airport budget simply can't stand the installation and upkeep costs of conventional electrical runway lighting.

Now a young but fast-growing Texas firm—The Rio Grande Distributing Company, of Dallas—has a simple and inexpensive taxiway "lighting" system that holds promise of solving this particular problem for a good many airports.

The Rio Grande system consists of nothing more than all-angle taxiway reflectors placed along the sides of taxiways and at runway intersections at intervals of about 200 feet. Each reflector consists of an aluminum can mounted on an aluminum shaft or rod which fits into a holder of aluminum tubing set in a collar of concrete flush to the surface. The "Scotchlite" covering around the can is visible and highly reflective from all angles and "lights up" instantly upon being reached by the beams from aircraft landing and taxiing lights.



Reflector

Snap Off When Struck

The Rio Grande reflectors are not rigid in the same sense as most airport lighting fixtures but are so designed with a fracture point near the ground so that they will snap off when accidentally struck by a plane, jeep or mowing machine. This is an added safety feature.

The reflectors come in three colors—red, white and blue—with the white used to "light" the taxiways, the blue used to mark turn-offs, and the red used to mark irregularities and obstructions.

The CAA favors installation of permanent electrical taxiway lights at major air terminals but encourages installation of the less expensive

lighting such as the Rio Grande type for interim use, at least.

From the airport operators' standpoint, it is the dollar savings inherent in this system of taxiway lighting that counts most heavily. The initial cost of the reflectors is low—about \$7.50 each, including installation, which is no great problem since regular airport maintenance workers can pour the concrete bases for the collars or holders.

Weatherproof Materials

No maintenance of the reflectors is required as the metal parts are made from durable weather-resistant materials, and the Minnesota Mining & Manufacturing Company guarantees the life of the "Scotchlite" for a duration of eight years. Furthermore, the mowing problem is reduced to a minimum by easy removal of the reflector from the ground, and the reflector is easily adjusted to various heights to take care of snow, high grass and sand conditions.

Visible for half a mile or more, the reflectors are of real assistance to

pilots, clearly outlining turn-off points and taxiways and thereby facilitating airport ground traffic, particularly during periods of low visibility at night. Airline pilots who commented on an experimental installation of the taxiway reflectors at Love Field, Dallas, praised them highly.

To the airlines, lighted taxiways mean lower ground operation costs. With the taxiways clearly marked, pilots will not overshoot the turn-offs, as is sometimes the case at many airports. Also, with turn-offs positively located, there will be less braking and less reversing of propellers than is the case when there is uncertainty as to their location.

Speeds Ground Traffic

And, of course, the speed-up in ground traffic that results when taxiways and turn-offs are adequately lighted at night is a distinct aid to air traffic control, enabling it to handle more landings and take-offs on a single runway during a given period.

The all-angle taxiway reflector is the "brain child" of R. L. (Bob) Wingfield and John S. Bingham, young Dallas manufacturers, who were assisted in its development by the management of Love Field, by airline pilots and by the CAA.

They think they have a product that most commercial airports need. Installations, depending upon the number of lineal feet of taxiways to be marked, cost only from \$1,000 to \$1,500 per airport, and literally hundreds of airports can afford a capital expenditure of that size when it holds promise of speeding up ground traffic while at the same time increasing safety.

Not unveiled until a few weeks ago at the American Association of Airport Executives convention in Columbus, the all-angle taxiways reflectors have attracted lots of attention in airport circles. Wingfield says the company has orders for installations from Omaha, Dallas, Houston, San Antonio, Memphis and Lexington, Ky., while potential customers who have manifested keen interest in the reflectors include about 30 other major airports.



Demonstration—William L. Anderson (right), executive director of the Pennsylvania Aeronautics Commission, appears interested as Bob Wingfield, of the Rio Grande Distributing Co., explains the construction and workings of the all-angle taxiway reflectors designed as an economical means of "lighting" airport taxiways.

Airport News Digest

• **A \$7,100,000 contract, believed to be the largest single airport terminal building contract ever let, has been awarded to John McShain, Inc., for construction of a passenger terminal building at Philadelphia International Airport. Airways Engineering Corp., of Washington, designed the structure.**

• **A Federal-aid grant offer of \$1,171,930 for the grading and drainage of a new 6,100-foot instrument runway at Newark Airport has been issued by the CAA to the Port of New York Authority, increasing to \$5.4 millions the grants made under the Federal Airport Act to airports in the New York metropolitan area.**

• **Northwest Airlines is building a large concrete dock extending to the aircraft apron at Wold-Chamberlain Field in Minneapolis to facilitate the handling of its air cargo. A conveyor belt will carry cargo from the end of the dock into a new freight terminal the company is building to provide 2,500 square feet of floor space.**

• **Cleveland's hopes of replacing its 1929 airport terminal building with a modern \$5,000,000 structure have been rekindled since Mayor Thomas A. Burke announced that studies have been initiated of a proposal to have the City Council issue revenue bonds for the new building. A \$5,500,000 bond issue was narrowly defeated at the polls last November. The proposed revenue bonds would require only Council approval.**

• **Muscogee County (Ga.) commissioners have approved lengthening of the northeast-southwest runway at the county airport near Columbus from 3,800 feet to 5,000 feet. Project will cost about \$250,000, plus the cost of 60 acres of land needed for the expansion. The CAA will furnish half the money.**

• **Revenues at Weir Cook Airport, Indianapolis, are running nearly \$1,000 a month more than a year ago, and the management recently decided it was able to drop trifling charges to visiting airmen, such as the \$2 overnight tiedown fee.**

• **Preliminary plans for a new administration building at San Francisco International Airport have been approved by the Public Utilities Commission. The plans drawn by Architect William P. Day, call for a modern structure consisting of four upper stories, a ground floor and a "spectacular" lobby. Cost will be about \$4,750,000. Building will be completed in early 1952, it is expected.**

• **Merrill C. Meigs Field, Chicago's lakefront airport, is to be formally dedicated on June 30. The city is planning what may prove to be the largest "fly-in" of Flying Farmers and their families and guests ever staged anywhere. The executive board of the National Flying Farmers Association have officially approved participation by their members and the city is arranging many special events and free attractions. All incoming planes will be landed that day at O'Hare Field and ground transportation furnished to Meigs Field.**

• **The aviation commission at Portland, Ore., has ordered a survey of 15 potential sites for an airport to accommodate private planes and thus relieve congestion at the municipal airport.**

• **Bids for construction of a terminal building, control tower and high intensity runway lights for Bluethenthal Field, Wilmington, N. C., have been approved. Cost will be \$180,933, and work will be completed in spring of 1951.**

• **Negotiations for the purchase of all property needed for Shreveport's new airport have been completed.**

• **Work is to be started this month on a new reinforced concrete administration building at Lewiston (Idaho) Municipal Airport. The building will cost about \$125,000 and is expected to be completed about November 1.**

• **Showcases displaying the products and services of leading industries of the Baltimore-Washington area will be one of the features of the terminal building at Baltimore's new Friendship International Airport, to be dedicated June 24. Twenty of the illuminated glass display cases will be on the main level and 22 on the lower level. A number of companies have arranged for exhibit space.**

2,777 New Fields Forecast By National Airport Plan

Of the 5,093 projects listed in the recently announced 1950 National Airport Plan, a three-year forecast, 2,316 are for improvements to existing airports and 2,777 are for development of completely new fields.

The plan lists 2,465 Class I airports, the smallest type, of which 1,848 would be new and 617 for improvement; 1,078 Class II airports, of which 440 are new; 579 Class III airports, of which 143 are new; 575 Class IV and larger airports, of which 52 are new; 312 seaplane bases and 66 heliports.

CAA estimated the cost of the work outlined in the program would be \$928,033,000, of which \$445,688,000 would be in Federal funds. The projects will be carried out on a need basis as Congress votes appropriations and local sponsors provide matching funds.

The new three-year program will carry through until the present expiration date of the Federal Airport Act on June 30, 1953. Meanwhile, efforts are being made to extend the life of the Act, and the Senate Interstate and Foreign Commerce Committee only recently approved, over Budget Bureau opposition, a bill to extend the Act until June 30, 1958.

CAA Airport Grant Offers

For the four-week period ended April 28, the Civil Aeronautics Administration made Federal-aid airport grant offers totaling \$2,939,135 to 22 communities, as follows, with classes in parentheses:

California: Ontario International (5), \$4,602.

Indiana: Gary Municipal (3), \$60,000; South Bend-St. Joseph County (4), \$52,200.

Iowa: Muscatine Mun. (3), \$5,500.

Minnesota: Crystal Airport, Minneapolis/St. Paul (1), \$6,500; Thief River Falls Mun. (2), \$14,000.

Montana: Billings Airport (4), \$1,152; Thompson Falls Airport (1), \$4,882.

Nebraska: Bassett Mun. (1), \$10,131; Perkins Memorial, Chambers (1), \$13,346; Gothenburg Mun. (2), \$9,367; Hay Spring Mun. (1), \$8,600; Omaha Mun. (6), \$114,052.

New Jersey: Newark Airport (7), \$1,171,930.

New York: Albany Mun. (4), \$145,000.

North Carolina: Fayetteville Mun. (3), \$1,950; Seymour Johnson Field, Goldsboro (4), \$9,000.

Oklahoma: Bartlesville, Phillips Field (3), \$7,837; Norman, Max Westheimer Field (5), \$800.

Oregon: Eugene, Mahlon Sweet Airport (5), \$6,988.

Rhode Island: T. F. Green Airport, Providence (4), \$850,000.

Utah: Moab Airport (2), \$3,798.

These boosted to 1,234 the total of grant offers made under the Federal Airport Program, and increased the Federal funds involved to \$107,500,778.



Ohio's Signs—Airport direction signs similar to this one near Toledo are of the type recently adopted by the Ohio State Highway Department and included in the Ohio Manual of Uniform Traffic Control Devices. Primary purpose of the sign is to start airport-bound traffic in the right direction at the intersection of state or U.S. numbered routes with other state or U.S. numbered routes. Made in the highway department's central sign shop in Columbus, the signs are 72" x 11" with six-inch letters of black on white "scotchlite" background. Cost is \$7.50 each, with two drive posts at \$1.25 each.

Airport People

Douglas A. Carr, who resigned his post as assistant manager of Phoenix's Sky Harbor Airport in February to take a job with an oil company, has returned to the airport job with a \$75 a month salary increase.

Earl Howard, owner and operator of the Howard Flying Service at Ames, Iowa, has signed a contract to act as manager of the Ames Municipal Airport.

Walter F. Bardsley has assumed the duties of manager of the Rutland, Vt., Municipal Airport, replacing **Euclid W. Coe**, who did not renew his lease when it expired recently.

Louis W. Cappelli, Jr., has been nominated as a senior airport attendant in the Rhode Island Division of Aeronautics, a post which will make him actual manager of the new Block Island Airport.

Cicero C. Sessions has been appointed chairman of the aviation committee of the New Orleans Chamber of Commerce, with **Robert R. Rainold** as vice chairman.

Patricia O'Regan, whose family operates the dining room at Shannon Airport in Ireland, has been appointed manager of the Sky Trails Restaurant at Oakland Municipal Airport.

J. G. "Pete" Barnard, chairman of the Owensboro-Daviess County (Ky.) Airport Board since its creation two years ago, has resigned for business reasons.

J. Francis Brenner, manager of Charleston (S. C.) Municipal Airport, is

hospitalized with injuries suffered in an automobile accident, and **Alderman Cornelius O. Thompson** has been appointed acting manager during his absence.

Jack Lysdale has been named manager of the South St. Paul municipal airport, where he has been a fixed-base operator for the past year.

John J. Matassa, manager of the New Orleans Airport, has been fired by **Joseph B. David**, chairman of the airport commission. David said the dismissal was based on "insubordination," while Matassa said his actions were a "protest against new and unfair conditions sought to be imposed on me."

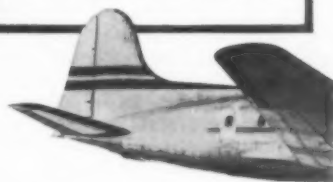
F. F. Zellinski, maintenance superintendent at Tucson Municipal Airport since it opened in October, 1948, has resigned to return to the construction industry.

George E. Campbell has assumed the duties of director of aviation for the East Baton Rouge parish.

Charles Schmied has been removed as airport manager at Burlington, Iowa, and responsibility for the airport operation has been placed with the superintendent of parks.

Bill Fuller, director of aviation at Fort Worth, got rid of the old unserviceable planes and engines which were an eyesore along the eastern edge of Meacham Field simply by posting a notice to all operators at the field that a \$50 monthly tie-down fee would be charged for all such equipment not removed by a certain date.

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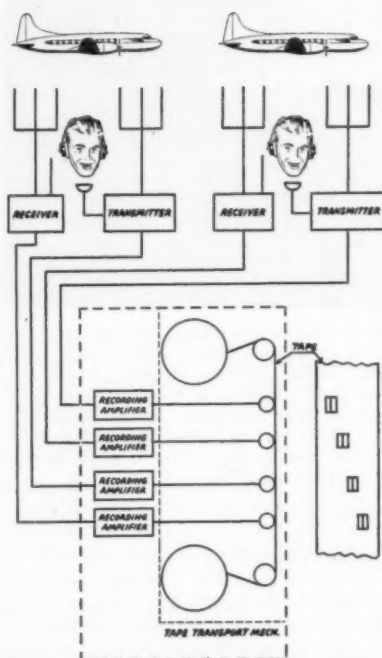
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Two New Multi-Channel Radio Recorders

The introduction of multi-channel communications recorders in recent months represents an important forward step in aircraft communications. Two manufacturers, Brush Development Co. and Stancil-Hoffman Corp., have designed and sold multi-channel recorders for use in monitoring air-to-ground and ground-to-air communications.

For the first time it is now economically feasible to maintain a complete and accurate record of the verbal interchanges between the flight crew and the communications center. Previous attempts at maintaining such a record were difficult, expensive and generally inadequate. Consequently, complete records have seldom been available.

Now United Air Lines has accepted delivery on the first of six sets of the Stancil-Hoffman recorders for installation at Salt Lake City, Denver, Omaha, Chicago, Cleveland and New York. United is already benefiting



Schematic

This is the basic arrangement of the Brush airport recorder showing the manner in which incoming and outgoing messages are transferred to the recording tapes. The Stancil-Hoffman recorder handles up to 15 channels simultaneously while the Brush unit handles a present maximum of 14. Either type unit can be adapted to a greater or lesser number of channels.

from the west coast installation of recorders by Aeronautical Radio, Inc.

ARINC installed dual multi-channel recorders, the first produced, at their joint communications stations in Los Angeles, San Francisco, Seattle and Honolulu stations, which serve most of the scheduled airlines operating on the west coast. These units were designed and built by Brush Development to ARINC specifications.

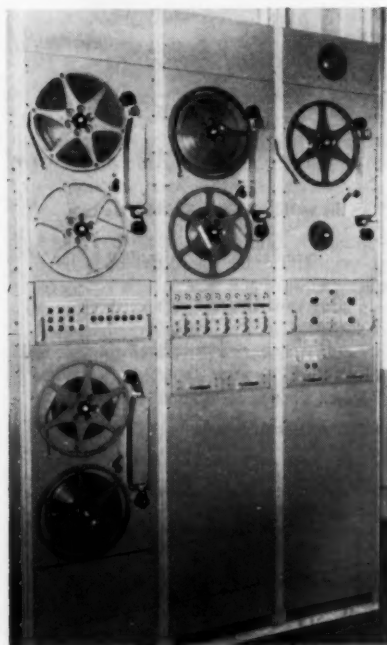
The basic provisions of the multi-channel recorders make it possible to monitor as many as 15 communications channels simultaneously on a single set of tapes. These tapes are reel mounted (see cut) with each reel providing four hours of continuous recording. Automatic controls switch the mechanism from one tape to the other at the end of its effective run and provide another four hours operation for a total of eight hours. Thus by replacing reels once in each

eight hours recording is automatic and continuous.

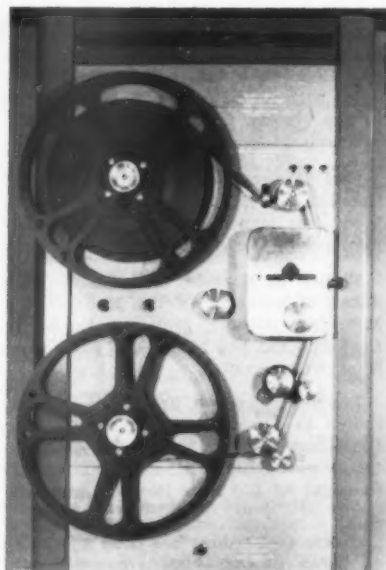
In the ARINC installations, Brush units providing 14-channel recording, an alternate recorder is provided for emergency coverage in the event of an equipment failure or providing the reels are not changed within the eight-hour period. This means the ARINC installations can provide up to 12 hours continuous recording without attention. The last four hours would be without benefit of the standby protection.

Cost of the recorder, about \$5,000 for the Brush unit, includes a 15-day supply of tapes. This period is dictated by the purchaser's decision to keep tapes for 15 days prior to erasing the record and reusing the tape. In estimating cost of operating the units, Brush conservatively figures tape life at five years. ARINC officials are confident the tapes will last 6-8 years.

After the tapes have been on file



Installation—The three cabinets shown here represent the complete Brush Development Co. dual multi-channel communications recorder and play-back unit as installed at Los Angeles. The cabinet at the left is the regular eight-hour recording set-up. The middle cabinet contains the alternate or emergency unit, providing the third four-hour period of consecutive recording, while the right hand cabinet contains the play-back unit.



Detail View—A close-up view of the reel arrangement and recording head mechanism is provided by this photo of the Stancil-Hoffman unit. UAL has ordered six of the S-H recorders. Upper left shows feed motor with reel attached. Tape moves from this reel through an idler (top right) into the head enclosure at the right. Tapes then emerge from head enclosure to a capstan which is driven by the synchronous drive motor, feeds through a second idler incorporating the automatic cut-off feature to the take-up motor and reel.

15 days, they are reinstalled on the recorders without any intermediate step to erase the old record. As the tape moves from the supply reel to the recording heads, the previous record is automatically erased and the tape readied for reuse.

Anything which interrupts the recording process, including tape failure, speed inaccuracies, etc., causes the machine to automatically switch to the alternate recorder.

The S-H unit is keyed to a minimum of five channels while the Brush recorder is keyed for a minimum of four channels. In operation ARINC is using 12 channels for air-ground recording plus a 13th for ATC telephone communications recording. Either type unit can be adapted to a greater number of channels but there is a feeling that use of additional recorders, rather than greater individual capacity, lends versatility to the mechanism.

The Stancil-Hoffman multi-channel recorder has integral provisions for playing back any one tape during the recording period. This makes it possible to check the operation of the

recorder while it is recording. As provided for in the ARINC specification, the Brush unit provides a separate assembly for play-back purposes. Either unit can be readily adaptable to fit the purchaser's needs.

Provisions of the tape include an accurate time reference which makes it possible to determine the exact time at which the recorded conversation took place. It is possible to play back any two channels simultaneously thus establishing the time relationships between messages on separate channels.

Cost of operating the recorders is very small. Based on amortizing the \$5,000 Brush unit over a five-year period, the 14-channel unit would be paid off at the rate of 2c per channel per hour. Add to this an estimated 3.2c per channel hour for tapes (based on five-year tape life) and total cost is about 5c per channel-hour. In its experience to date, ARINC has found maintenance requirements negligible.

The tapes used are about 5,000 feet in length, .7 inches wide and mounted on a 13 $\frac{3}{4}$ inch reel. A 15-day supply

of tapes, the maximum now programmed, can be stored in a space 14x14x32 inches. This represents more than 500 miles of sound track.

The need for multi-channel communications recording equipment has been long standing. A recording of the crew's communications messages was the key in uncovering the cause of the Mt. Carmel accident and brought about investigations which have since improved basic design of certain aircraft systems and crew procedures.

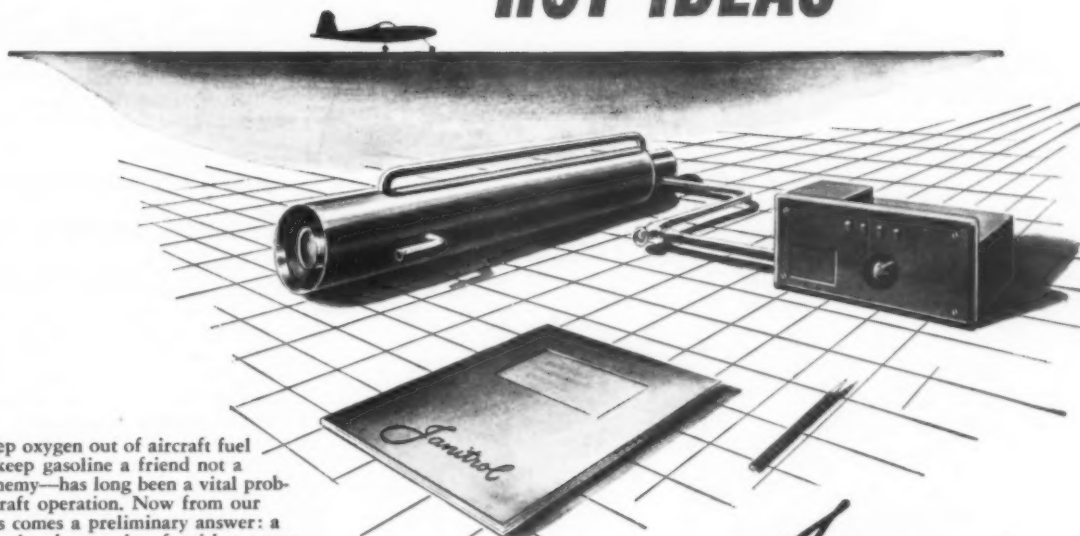
There is an even greater need for such recording in CAA control towers where the record clearly indicates the advantages which would stem from accurate and continuous recording.

IATA Moves NY Office

The New York branch office of the International Air Transport Association has been moved from 11 Broadway to Room 2134, 165 Broadway. New telephone number is WOrth 4-4637. Rudolph Feick is secretary of the office, which administers the work of IATA Traffic Conference No. 1.

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Heliplane Corp. to Offer Unique Maintenance Plan

By B. J. WARD

SOMETHING new in lightplane servicing and distributorship is being planned by the Helio Aircraft Corp., Norwood, Mass. When the Heliplane arrives on the market next August, it will find the stage set with factory-trained maintenance personnel and prepaid maintenance and inspections.

For the first time in the history of lightplanes, the buyer of an aircraft will be offered a "policy" for all-inclusive future maintenance and upkeep costs. His only concern will be keeping oil and gas tanks filled.

In setting up the service guarantee, which will be similar to that now used in the home television field, Heliplane directors hope to immunize their plane against some of

the apparent ills of the lightplane business.

One aim is to circumvent the disillusionment concerning aviation which resulted when buyers of thousands of cheap war surplus aircraft suddenly discovered the cost in dollars and time of keeping planes operable. The old marketing idea of selling the customer a plane and then leaving him with the responsibility of seeing that it is maintained according to a mass of regulations and technical data has often resulted in the sale of a plane but eventual classification of aircraft as "white elephants."

Service Plan

The Heliplane service plan provides that agencies with factory-trained mechanics will be set up in

each new territory before sales efforts are started. The service base operator will be paid a fee for each airplane in his territory and will be responsible for its operational record and for compliance with all service bulletins, periodic inspections and maintenance without any additional charge to the owner.

An agreement still remains to be worked out with the engine manufacturers but, if this can be arranged, the aircraft owner will be relieved of all service and maintenance headaches.

If the landing gear or propeller is damaged in a rough field landing or if the engine develops a broken crankshaft or cracked cylinder head—those rare but costly "low blows" of aviation—the contract is insurance to cover the expense. Factory authorized improvements and modifications will be installed free of charge.

From the viewpoint of the fixed base operator, the maintenance "policies" taken out in his area by Heliplane owners will mean both established responsibility and an assured income. Sales and service, always an unpredictable phase of the business, may assume a healthier overall pattern since work can be planned and parts stocked well in advance.

Market testing of the Heliplane plan will be carried out during the next year with the initial 100 aircraft being built. According to Dr. Lynn Bollinger, co-designer of the plane, "This system will give us a chance to build a dealer-service organization in which the dealer has reasonable assurance of enough income to keep him going—something which benefits the consumer as much as it does the dealer or factory."



50-Mile Control Zone—Hatched areas above, not presently controlled, would be included in a 50-mile control area around New York City under a plan being considered by the air space subcommittee of the Air Coordinating Committee. Flying above 700 feet without flight plan would be limited to three miles or better visibility. Below 700 feet the present minimum of one mile would continue to apply. Ten local fields would be included in the newly controlled areas.

VA Okays Four-Place Cross-Country for GI

Flying schools participating in CAA's experimental four-place cross-country training program last month received authorization to offer the course under the GI Bill of Rights. Initially, there was some difficulty in getting Veterans Administration approval for the course, but CAA officials state that the only hold-up now involves cases where the cost per flight hour is in question.

The group training, given largely in four-place aircraft, appears to offer considerable advantages over the standard private pilot flight course. A minimum of 55 hours is required, with not less than 15 hours dual, 10 hours solo and 30 hours flight instruction time with the student as an observer.

Four Under Way

To date, four of the schools have started four-place training: Clinton

LOCAL OPERATIONS

Aviation Co., Denver, Col.; W. H. Coffin Vail Field, Los Angeles, Cal.; Stephens College, Columbia, Mo.; and Parks College of Aeronautical Technology, E. St. Louis, Ill.

Reports from these flight schools indicate that a problem exists in getting together three students with similar age level, flight experience and general background. However, Parks College reports that they are favorably impressed with the way the course is working out well and believe students are "gaining a lot" from observing the flight instruction of other students. According to CAA, the courses should be well underway in the flight schools by the end of June and then will offer a basis for overall evaluation of the course.

In addition to the 35 schools listed in the February 1 issue of AMERICAN AVIATION, 10 more civilian flight schools have been approved, bringing the total of approved schools to forty-five. The newly approved schools are:

Aero-Way, P. O. Box 6064, Richmond 22, Va.

Aero-Ways, Inc., Municipal Airport, Cleveland, Ohio.

Clinton Aviation Company, Stapleton Airfield, Denver, Col.

Davis Field Flying School, Bayport, Long Island, N. Y.

Des Moines Flying Service, Inc., Municipal Airport, Des Moines, Iowa.

Glendale School of Aeronautics, 1435 Flower Street, Glendale, Cal.

Lane Aviation Corporation, No. 1 Hangar, Port Columbus, Columbus, Ohio.

Shewalter Corporation, Municipal Airport, Orlando, Fla.

Stickney Flying Service, Edgemont Municipal Airport, Edgemont, S. D.

Ward Air Service, Inc., Hancock Field, Syracuse, N. Y.

Aeronautical Training Society Elects Graham

Aeronautical Training Society has elected William J. Graham of Pittsburgh, Pa., vice president and chairman of Pittsburgh Institute of Aeronautics and operator of a group of aviation bases for flight and technical training, as its new president. Maxwell W. Balfour, Spartan School of Aeronautics, Tulsa, Okla., has been named vice president.

Elected as directors are: E. Merritt Anderson, Milwaukee, Wisc.; Hugh Copeland, Miami, Fla.; Albert I. Lodwick, Lakeland, Fla.; Harry S. White, Palo Alto, Calif.; Major C. C. Moseley, Glendale, Calif.; Frank Hulse, Atlanta, Ga.; Oliver L. Parks, East St. Louis, Ill.; Clyde E. Brayton, St. Louis, Mo.; Beverly E. Howard, Charleston, S. C.; Major William F. Long, Dallas, Texas; Ray Hylan, Rochester, N. Y.; Graham and Balfour.

ATS members, who operate about 120 aviation bases in 40 states, trained approximately 250,000 pilots for the USAF and allied governments during World War II.



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COMMUNICATION PAPERS

For Local Operators

Lightplane Prototype Bill

The personal aircraft business is divided over the desirability of the Johnson prototype bill, S.2984, to provide funds to underwrite development of a utility lightplane. In testimony before the Senate Interstate and Foreign Commerce Committee, **Joseph Geuting** of AIA's Personal Aircraft Council pointed out previous failures in government sponsored projects and said that publicity about a new revolutionary plane would further depress the market for existing planes, doing more harm than good.

However, **John Lawler**, president of Aeronca Aircraft Corp., submitted a statement in favor of the bill, saying that in his opinion lightplane manufacturers lack funds to take the risk of backing new developments—and that, as a result, development has not come.

Wayne Weishaar, Aeronautical Training Society secretary, reported that ATS members, who distribute or sell at retail 40-60% of all personal aircraft in the United States, had met and declined to endorse the bill but voted unanimously that whatever prototype bill may be finally passed by Congress should include provision for personal aircraft. **Merrill Armour**, representing Aircraft Owners and Pilots Association, stated that the bill would aid in making available to the public a plane which has safety and utility and could help prevent a recurrence of the 850 fatal accidents in 1948 of non-air-carrier operations.

Crocker Snow, representing the National Association of State Aviation Officials, supported the bill, saying it will fill a gap in meeting today's needs through financing the required basic research and development by private enterprise.

NATA Agriculture Emblem

This is the new agricultural insignia of National Aviation Trades Association which comes in red, blue and white on ten-inch aluminum sheeting. **Charles Parker**, NATA Washington director, says there is adequate space for it on any type aircraft.

Effort is still being made to unify members interested in crop dusting to form a strong agricultural group within NATA. The "Code of Requirements for Members Engaging in Commercial Aerial Spraying, Dusting and Seeding Operations," approved last November, has been distributed as a guide to NATA state chapters and Parker states he would like to see NATA strong enough eventually to engage a full-time agricultural chemical specialist to advise members.

NATA members have been instrumental in developing a new CAA proposal which would replace the existing requirement for a waiver when aircraft are modified for agricultural uses. This would allow the operator to make reasonable modifications or changes in loading without the red tape of CAA approval.

Surplus Airway Beacons Available

Those of you who could use a surplus CAA airway beacon as an airport tower beacon will be pleased to learn that the proposal of **Clarence F. Cornish**, director of the Indiana Aeronautics Commission, has brought results.

Cornish pointed out early this year (AMERICAN AVIATION, February 15) that CAA is discontinuing a certain number of airway beacon lights as non-essential and suggested they be made available through state aeronautical agencies to small airport operators who cannot ordinarily afford a tower beacon for night flying aircraft. Airport operators

could install, operate during reasonable periods of darkness and maintain the lights at no cost to the government.

CAA is now informing its regional representatives that surplus airway beacons are to be made available immediately in the following order of priority:

1. To State Aeronautical Commissions if they are willing to accept the transfer of the beacons for use in their programs, without charge.

2. To local municipalities, without charge.

3. For sale to any buyer.

4. If no transfer or sale is effected, the beacon will be dismantled using CAA funds.

5. If no CAA funds are available, the beacon will be decommissioned, the electric power cut off and the beacon left in place until funds become available to move it to a warehouse.

CAA officials point out that these provisions, which have taken months of legal deliberation, cover every contingency including that of no CAA funds. Modification of the lights for airport beacon use requires only changing the gearing to a different rotating speed and double ending the lights with a green and a white lens.

The same letter of instruction to CAA Regions establishes a procedure for disposing of surplus intermediate landing fields. Municipalities and local subdivisions will be contacted first and, if they do not want the field, the state aeronautics commission will be approached to determine if they can use the field in the state program. If attempts to transfer the field fail, it will be put up for sale or, if a buyer cannot be found, equipment will be dismantled and the field decommissioned.

Among the Operators

Walter Army, manager of Leicester Airport, Mass., has awarded flying scholarships to the boy and girl outstanding in science at the Leicester High School for the past two years. Also, we hear that he has encouraged all of the students to visit his airport and over 90% of them have had the opportunity to fly . . . Strange and confusing rumors come from Texas about **Roy Taylor** of Southwest Aircraft at Fort Worth. Seems he trades airplanes for land. Ranchers, having an abundance of land and a propensity for making deals can usually be talked into wanting an airplane. And if, after association with the rocks, Taylor decides he doesn't care for the contour, he looks for some practical person with a desirable airplane. This we've got to see . . . **Burnham Litchfield**, manager of Martha's Vineyard Airport and Old Colony Aviation, is the island's sales, repair and maintenance representative for Willys Jeeps and International Harvester farm machinery. He takes this month's blue ribbon as "most well rounded operator"—in addition, he builds USAF fueling ladders and has tenanted the airport's unoccupied Navy barracks with 10,000 chickens.

• **The Taft-Teague Bill** (S. 2596) on veterans' training passed the House and now is subject to conference between both Houses before final approval. It gives the Veterans Administration authority to refuse a veteran additional course if "it is not in the same general field as his original educational or occupational object." Gliding is prohibited as being recreational. In the absence of substantial evidence to the contrary, flight training will not be considered recreational "when a certificate in the form of an affidavit supported by two corroborating affidavits by two competent disinterested persons" has been furnished stating that the training will be useful to a veteran in earning a livelihood.

• **The single-place Seibel Skylark helicopter** was approved for CAA type certification on April 13. Seibel Helicopter Company of Wichita, Kansas, plans to build about 30 of the helicopters, which are powered by Lycoming O235-C1 engines, within the next year. Specifications have not as yet been published.

—B. J. WARD



CAA Specification Changes

Piper PA-18 and PA-19 aircraft are approved use of the A. W. Whitaker tandem landing gear, Consolidair Model 17 wheel fenders, Goodrich Model 841A main wheel-brake assembly and Goodyear Model CL6-HBM main wheel-brake assembly, by Specification No. 1A2.

Piper J3C-65 and PA-11 aircraft are approved for installation of Martin Airways Model A crop-spraying equipment if aircraft is placarded for aerobatics, by Specification No. A-691.

Continental C-145 engines are required to have inspection for cracks of cylinder barrels at the base flange fillet and of the crankcase by June 1, 1959 and every 25 hours thereafter, by Airworthiness Directive 50-18-4. Serious failures in flight of these parts have been reported. Since small cracks show up easily by oil leaks, it is recommended that inspections include a runup with a clean engine.

CAA Airworthiness Directives

Piper-Stinson 108 Voyager & Station Wagon aircraft have developed a number of instances of broken core strands in the rudder cables due to wear on the pulley at fuselage station 16.75 (first pulley aft of rudder pedals). Airworthiness Directive 50-17-2 requires: (a) within the next 25 hours and every 100 hours thereafter, remove cables from pulleys, bend in "U" where they pass over pulleys and replace cables showing wear; or (b) normal inspection procedures may be resumed if the AN210-3A pulleys are removed and larger pulleys No. 41001-2 and cable guards No. SK253-2 are installed.

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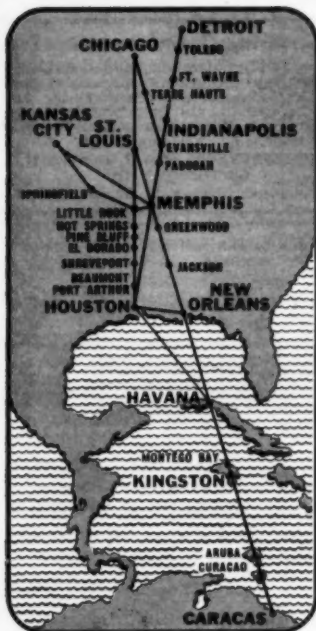
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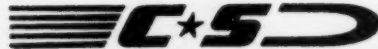
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WINGS OF YESTERDAY

25 Years Ago

The organization meeting of the National Air Transport, Inc., was held May 21, 1925, in Chicago under the guidance of Howard Coffin, organizer of NAA, and Clement M. Keys, president of Curtiss Aeroplane and Motor Co. The company, capitalized at \$10,000,000 by private investors, was planning an air express service and hoped to begin operations on the New York-Chicago segment in early autumn of 1925.

Daniel Guggenheim presented \$500,000 to New York University for the establishment of a School of Aeronautics in the University's College of Engineering.

10 Years Ago

(In American Aviation)

The Civil Aeronautics Board and the Civil Aeronautics Administration were to be created from the Civil Aeronautics Authority on June 11, 1940, following Senate refusal to reject the President's reorganization plan to place the agency under the Department of Commerce.

President Roosevelt called for a fleet of 50,000 military aircraft and an annual production capacity of 50,000. Industry leaders felt it would take three years to reach that capacity.

TWA was planning to inaugurate the first four-engined domestic passenger service during July using five Boeing 307 Stratoliners.

LETTERS

Bible of Facts

To the Editor:

I would like to extend my compliments to you and the members of your staff for your very excellent April 15 edition of AMERICAN

AVIATION. I found same to be the most complete "bible" of facts and figures yet published re the American airline industry.

In addition, I would like to know when your Mr. Worcester, whom you recently acquired from England, will be writing some of his very interesting articles on American commercial aircraft. I was quite a follower of Mr. Worcester when he was writing in England and I surely hope that your office intends to use his articles more often throughout your publications.

THEODORE LAVEN

Field Service Representative
Consolidated Vultee Aircraft
Corporation

(Editors' Note: Thanks for your kind comments on our Air Transport Progress issue and on Dick Worcester. He will be concentrating on the commercial as well as military models in his design studies.)

BOOKS

EXPLORING OUR NATIONAL PARKS AND MONUMENTS. By Devereux Butcher, executive secretary, National Parks Association. 224 pp., illustrated. Houghton Mifflin Co., Boston. \$3.50.

Airline sales personnel who are pushing travel to national parks will find this second edition to be both authoritative and useful. Prepared under the auspices of the National Parks Association, it neglects air transport services to the numerous parks, but it does contain a guide to accommodations of all kinds. There is a complete description of each park and nature monument and excellent photographs, plus two full-page maps.

OBITUARY

Harlan M. Willcox

Harlan M. Willcox, American Airlines' chief cashier in New York, died May 8 of a heart attack. He had been with the company more than 19 years, 11 of which were spent in New York. He was 51 years of age.

COMPACTION ROLLER: Huber Manufacturing Co., Marion, Ohio, has published Bulletin H-140 describing the new Huber compaction roller, a self-propelled machine which compacts 4,100 square feet an hour. Per-lineal-inch compaction of the Huber compaction roller is 5,387 pounds.

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IN FLIGHT

A PAGE FOR ALL PILOTS

Dorsal-Fin Cockpits

How would you like a cockpit located in the tail rather than in the nose of the plane? Well, believe it or not, that is the position preferred by **Edward R. Dye**, head of the Development Division of Cornell Aeronautical Laboratory. In a speech before the transportation session of the National Fire Protection Association's recent annual meeting, Dye said he thought transport plane crews should be relocated and that his favored position for the pilot would be "in a cockpit located above and aft of the fuselage, say in the dorsal fin."

Other Dye recommendations were: provision of a crash and fire-resistant compartment in the tail of transport airplanes for one crew member, probably the steward; inertia switch control of fire extinguishing equipment; placing passenger seats aft of the wing to take full advantage of the energy-absorbing characteristics of the plane's structure; and the use of rearward-facing seats, securely anchored, with strong, well-padded backs to support the entire spine and head.

Jet Takeoff Procedure

The slight differences between the takeoff of a jet and a piston-engined aircraft center on the modified engine handling at the start of the takeoff run and on the absence of a propeller towards the end of the run and after the aircraft is airborne. It is customary to run up the jet aircraft to a definite rpm which should be held on the brakes. If the aircraft judders forward before this rotational speed is reached the brakes would not be satisfactory after landing. This speed, which is generally not far short of the maximum, is a good time to check the jet pipe temperature.

When the brakes are released the acceleration of single jets and even twin jets is a little less than from powerful piston-engined aircraft but there is a welcome absence of swing and the airplane may be steered down the runway on the brakes to about 70 mph IAS, after which the air rudder is usually effective.

The takeoff is generally rather longer with a jet and in modern aircraft the angle of attack becomes very high before the wheels leave the ground. Swept-wing types have to be lifted particularly high. The actual moment of takeoff at 120 mph is characterized by less elevator sensitivity than is normal with a propeller. Any jet feels a little sloppy fore and aft till the speed gets up to about 150 mph.

Once the wheels are up the speed mounts very rapidly and in a twin-jet a comfortable climbing speed is usually Mach .5. The path is flat to begin with, but can be made progressively steeper without getting high jet pipe temperatures. The climbing rpm is usually only 500 rpm less than the maximum so a fine throttle adjustment might be needed. Flaps to maximum lift position are usually used for takeoff and the change of trim when they are raised is not great.

Pilot Protection in Route Transfers

Greater protection for airline pilots flying routes which are transferred to another carrier through merger, consolidation or purchase is being asked by **David L. Behncke**, president of the Air Line Pilots Association. In a letter to **Francis W. Brown**, CAB's chief examiner, in connection with the possible transfer of nine United Air Lines route points to several feeder carriers, Behncke said the Board has a "special obligation" to protect adversely-affected pilots in any such transfer.

If the route transfers are made, Behncke said, United

pilots would be adversely affected because UAL would have to eliminate several trips which currently serve the cities involved. And in view of the run structure and seniority provisions of the pilots' employment agreement with UAL, the displacements of pilot-employees would bring about a chain reaction which could very well result in complete elimination of a considerable number of UAL junior pilots.

Behncke urged that a condition be attached to all route transfers so that pilots would follow their routes in the acquiring company without loss of employment or impairment of seniority.

New Ford Chief Pilot

New chief pilot of personnel air transportation for the Ford Motor Co. is **E. F. Lundberg** of Dearborn, Mich., formerly a pilot for three and a half years with Delta Airlines. Lundberg will head the six pilots who operate four company-owned aircraft, two DC-3's, a Grumman Mallard and a Douglas A-26, to transport company personnel. The home base is Wayne County Airport, near Detroit.

During the war, Lundberg was a Squadron Leader giving flight instruction in the Royal Canadian Air Force and then flew in the USAF as pilot for Gen. Wm. Bryden, USA.

Cockpit Complication

The printed checklist which must be followed by pilots of the 150,000-lb. class civil or military aircraft with four of the largest piston engines seems almost as thick as a Wycliffe Bible. Many people are wondering exactly how much further the multiplication of controls can go. The mental and physical task of supervision and manipulation alone becomes a major feat of endurance and memory, introducing even more exacting standards of proficiency.

Anxiety in a turbine-engined equivalent, however, is not necessarily less—but the worries are of a different order. If the cockpit of the piston-engined aircraft resembles the console of a theater organ, the cockpit of the turbine-engined transport is like a violin. The four little faucets of the violin are, unfortunately, just as difficult to control. Every phase of turbine flight is speeded up and it is hard enough making the right decisions anyway, but to have to make them in a shorter time is just that much more tricky.

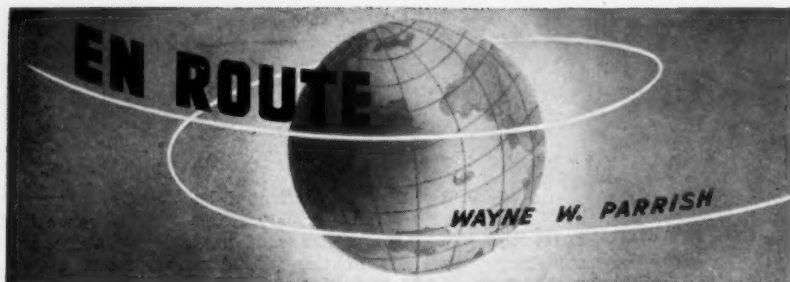
Airline Pilots' Hearing

Loss of hearing attributed to flight conditions is not a serious problem, according to the current edition of *The Journal of Aviation Medicine* which carries a paper on airline pilot hearing.

In a study of 47 airline pilots taken at intervals of ten years for each pilot, the loss of hearing of 36 of them was 15 decibels or more, in one or more frequencies.

Most of these losses were recorded for frequencies of 4,096 cycles per sec. or higher. Nine pilots had a loss of 15 decibels or more in the frequencies of normal speech (512 to 2,048 cycles per sec.) Four pilots had a final threshold of hearing which was greater than 30 decibels for one or more of the frequencies of speech in one or both ears.

It is recommended that the best test of hearing is the spoken voice and directional radio beams delivered by earphones against a background of simulated noise and not in quiet surroundings.



In Prison. The only time I've ever been locked in a cell was in Spain. And the only time I've ever met a complete government, a president and all his ministers, all locked up in prison, was in Spain.

It was in March of 1930. Like everyone else who goes to Europe I was armed with letters of introduction from well-wishers. I was just out of school and on leave from *The New York Herald Tribune* but as a cub reporter my background of European politics was virtually zero. I was a sightseer, not a reporter.

I used few of the letters of introduction but by some odd chance I used the one in Madrid. It was to a Lutheran minister and in Catholic Spain a Protestant minister was a rarity. Since I was a reporter, he thought, I must be interested in Spanish politics, so he insisted that I go with him to the big new Carcel Modelo, the "model prison," on the outskirts of Madrid.

It seems there had been a revolution that hadn't gone off. Alphonso XIII had imprisoned the revolutionaries, who had already figured out what government posts they would hold if they could throw out the king and establish a republic.



Behind Bars. My Lutheran minister escort seemed to have free entrance to the prison and also to be pretty well mixed up with the revolutionaries. We entered the prison and went to a big cell block that was quite well furnished. Obviously the revolutionaries rated high enough and had enough power to merit comfortable quarters even though they were behind the bars.

I went from one cell to another, first shaking hands with the "president" through the bars and then the various "ministers." Then I was put into a cell adjoining the one occupied by Don Fernando de Los Rios, who was to be Minister of Justice, and the cell door clanked shut behind me. I talked with Don Fernando for a half hour or so, separated by a barred opening between the cells. He had taught at Columbia University and spoke fluent English. I was quite ignorant of what the whole thing was about except that I realized that I was in Spain at a precarious time. After our talk I was let out of

my cell without any formalities and from then until I left Spain I was never bothered in the slightest.

Several months later I was walking down the main street of Prague, Czechoslovakia, and saw a *Paris Herald* headlining the second—and successful—revolution. The entire cabinet that I had met behind bars was in power and Alphonso was dethroned and had left the country. This first group led by President Alcalathia Zamora wasn't a bad gang at all. They were liberals and wanted to do something to improve the economic and social conditions of their country. But in a few years the extreme leftists, aided by Moscow, moved in, as they do in all liberal efforts, and the Spanish government moved steadily to the left—ending in the bitter civil war in which Franco came out on top.

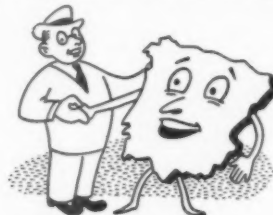


El Caudillo. So when I met Franco in February of this year I was more than casually interested in seeing the man who holds a tight grip over Spain. He is often compared to Hitler and Mussolini, but such comparison can be very misleading. Hitler and Mussolini were opportunists who were off their nuts in personal drives for power. Franco is the symbol and the leader of the conservative land-owning class and the church who wrested back control of Spain from the leftists. I don't approve of the rigid press censorship and the ruthless dictatorship which Franco has set up. Yet Franco saved Spain from a Moscow-dominated government which was all set to destroy the conservatism of the country. Which was better? It's a tough question. Each is an extreme and each is cruel and ruthless, but at least Franco is Spanish and represents elements within Spain.

What Moscow would have done is anybody's guess, but the working classes certainly wouldn't have been any better off than they are now—and poverty is everywhere in Spain today. I think I would take my chances on Franco "loosening up" and liberalizing rather than to have chosen the other road. There are numerous signs today that Spain wants to open up its country, to make friends, and to become accepted again by the western world. It is realizing that its isolationism isn't paying off economically and that to rejoin the other nations it must temper the dictatorship.

Pardo Palace. Our TWA press group got word only a matter of hours before our scheduled departure from Madrid that Franco would see us. In two buses we hurried out to the Pardo Palace outside the city. This was the scene of the recent wedding of Franco's daughter, elaborately pictured in *Life* magazine. As a palace it isn't overly-impressive on the outside, but two Moroccans on beautiful horses guarded the gate. If the palace was heavily armed and guarded it wasn't obvious to us.

Inside, the halls and rooms were lavishly embellished with colors and gold



with priceless tapestries and paintings and other works of art. Our crowd of about 40 lined up alphabetically by name and were taken through a series of rooms to the large office of Franco himself.

El Caudillo, as he is called, was even shorter than I had pictured him. He was nattily dressed and his complexion is just a little darker than the average Spaniard. His eyes were penetrating as he surveyed the crowd. He never smiled. One by one we moved up to shake hands while a foreign office official called out our names. But it was an odd affair. Just as each person moved up and put out his hand, Franco's eyes shifted immediately to the man behind. Thus one could not look him in the eye while meeting him. Rather a frustrating experience.

♦ ♦ ♦

Invitation. After all had passed by, we stood in a semi-circle while Franco welcomed us to Spain. Considering his power and his rule, I had expected to hear a deep strong tough voice. But Franco's voice is very light and on the high side. He doesn't speak English or if he does, he didn't try it. The foreign office official translated. Franco assured us we were welcome to come and go as we pleased, to write whatever we liked when we got home and we could come as often as we wanted, go anywhere, talk to anyone, investigate conditions for ourselves. I think he meant it as far as we were concerned, yet there is a rigid censorship in the press and of all outgoing dispatches by resident correspondents. I'm taking him at his word—because I want to go back to Spain.

It was all over in half an hour. The verbal reception had been warm and we were given to understand that the audience was the first of its kind ever granted by Franco. I seemed to sense a desire in the background to be understood, an effort to get us to understand what was really back of Spain's troubled times which began with the first revolution, that Spain has a dictatorship today but that there is a reason for it that goes deep into Spanish history, tradition and life. All I know is that it is difficult for outsiders to try to expert somebody else's country.



ALLISON TURBO-PROP ENGINES POWER NAVY'S GIANT PATROL BOAT TO AN AMERICAN "FIRST"

EQUIPPED with four new Allison T40 Turbo-Prop engines, the Navy's 60-ton XP5Y Convair flying boat chalked up an American first in its maiden flight from the harbor base of the Consolidated Vultee Aircraft Corporation at San Diego, California.

This long-range anti-submarine patrol seaplane is the first American aircraft to fly solely with Turbo-Prop power.

With a total weight of only 10,000 pounds and developing a spectacular 22,000 horsepower, the four Allison twin-turbine engines establish a world's

record in a horsepower-to-engine-weight ratio — 2.2 horsepower for each pound of engine.

The power from one of these T40 Turbo-Props is greater than the total power of all four reciprocating-type engines in a B-17 Flying Fortress, with only a fraction of the piston-type engine weight.

This first flight of the Convair clearly demonstrates revolutionary design advantages, through the use of Allison Turbo-Prop engines, now applicable to all military transport, cargo and commercial aircraft in the high-power field.

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